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THE IRON AGE

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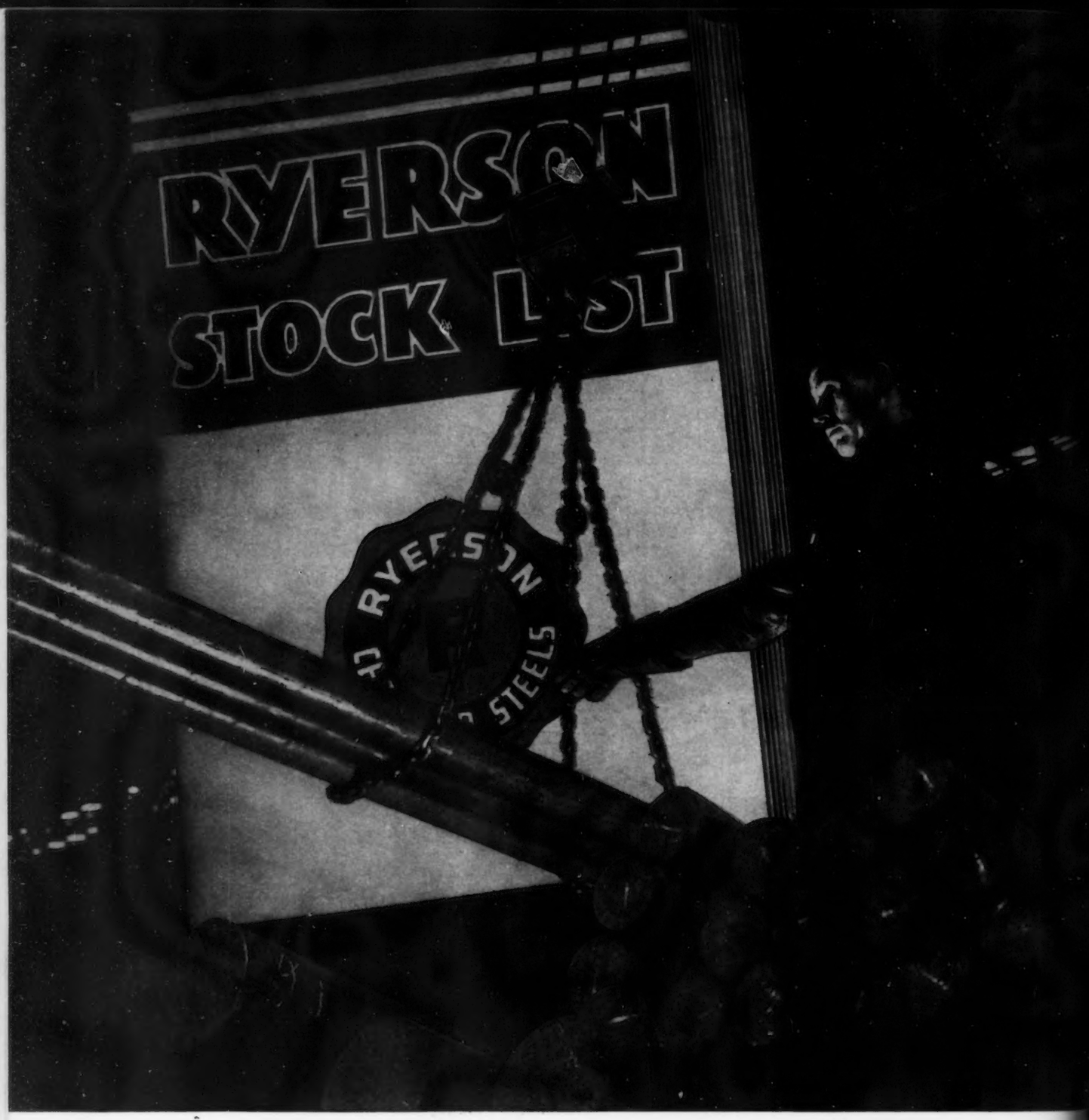

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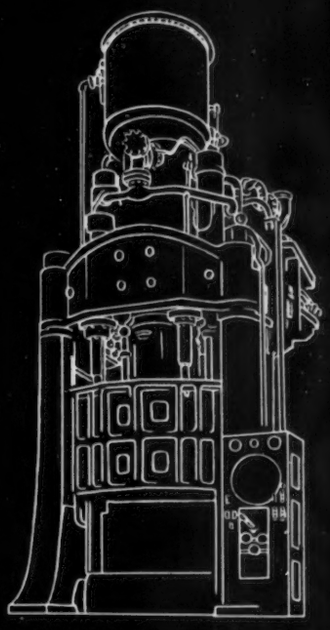

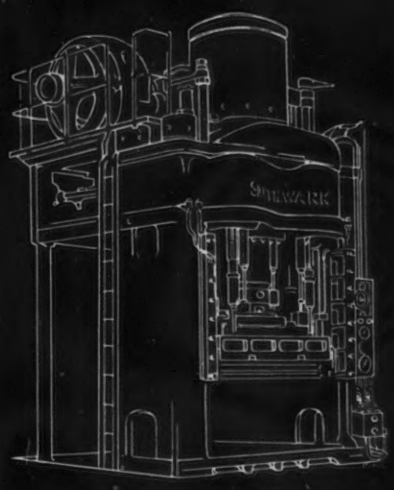

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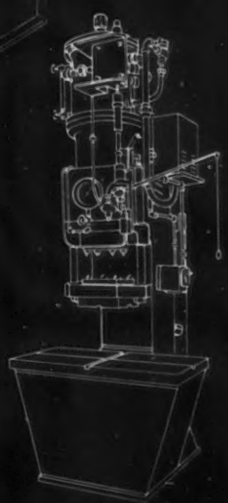

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New INDUSTRIAL LITERATURE

THREADING MACHINES.—Landis Machine Co., Inc., Church & Fifth Sts., Waynesboro, Pa. Folder describes the new Landmaco quadruple head threading machine designed especially to handle the maintenance and production threading operations of railroads. Features of the machine include an eight speed selective type gear box and individual spindle control.

ELECTRIC UNIT HEATERS. — Electric Air Heater Co., 555 South Byrkit Street, Mishawaka, Ind. Bulletin No. 38-A covers the construction, operation and application of Electromode unit heaters for commercial and industrial use. The adaptability of the Electromode principle of heating is clearly shown, particularly as applied to isolated, hard-to-heat places.

ROLLING GRILLES.—Kinnear Mfg. Co., 2450-70 Fields Avenue, Columbus, Ohio. Rolling grilles that combine architectural beauty with practical design are illustrated in this booklet. The application of these grilles to industrial and commercial buildings and private homes is shown, and construction features are discussed in detail.

GRINDING MACHINES. — Cincinnati Grinders Inc., Columbia Road & South Street, Cincinnati. Folder announces a new universal grinding machine with 12 and 16 in. swing. Features of the grinder include a heavy one-piece bed, a wheelhead with multiple shoe type spindle bearings and self compensating spindle bearings.

KOPPERS YEARBOOK. — Koppers Co., Koppers Bldg., Pittsburgh, Pa. This book contains an annual report of the operations of the company and a discussion of the functions of each subsidiary unit. Wages and employment in 1938 are carefully covered and property and corporate charts are included.

STELLITE CUTTING TOOLS. — Haynes Stellite Co., 205 East 42nd Street, New York City. Illustrated folder describes the new Haynes Stellite-2400 high-production cutting alloy. Sizes and styles of tool bits are listed, and data are given on what materials they will machine economically and on general resharpening practice.

STAINLESS STEEL.—Allegheny Steel Co., Brackenridge, Pa. An illustrated booklet describing Allegheny metal, a stainless steel that may be stamped, spun, cast, machined and welded. Booklet contains many examples of the use of the metal in various industries.

COPPER-BEARING STEEL SHEETS.—Bethlehem Steel Co., Bethlehem, Pa. Folder describes Beth-Cu-Loy copper-bearing steel sheets that are claimed to give 200 to 250 per cent greater rust resistance at but 4 to 5 per cent extra cost. Also included are results of several exposure tests showing average life of different metals.

WIRE AND STRIP ANNEALING. — Lee Wilson Engineering Co., 1370 Blount Street, Cleveland. Booklet discusses and illustrates a small, cylindrical, vertical tube-type furnace designed to take care of small miscellaneous batches where heat treating specifications vary from batch to batch. Design is said to make possible exceptionally close control of temperatures at the top and bottom of the charge.

GAS CONDITIONING UNITS. — W. S. Rockwell Co., 50 Church Street, New York. Circular No. 380 notes briefly the reasons for the growth in the use of protective atmospheres in furnace work, and describes the features of the company's standard gas conditioning unit.

Write for this literature on your company's letter-head. Please mention The Iron Age.

INDUSTRIAL TRUCKS. — Baker-Raulang Co., 2618 West 25th Street, Cleveland. This well illustrated, 18-page bulletin provides a rapid means of determining the type of industrial trucks best suited to perform a given duty. Elevating, crane, platform and hy-lift trucks and special trucks are illustrated in actual service, and principle specifications are given.

ROLLER CONVEYORS.—Palmer-Bee Co., 1700 Poland Avenue, Hamstramck P.O., Detroit. A comprehensive catalog devoted to describing and illustrating gravity and power driven roller conveyors. The construction and application of these conveyors are covered in great detail and numerous useful engineering data tables are included.

SHEET METAL PRODUCTS. — Milcor Steel Co., South 41st & West Burnham Street, Milwaukee. A well prepared spiral-bound booklet listing the numerous sheet metal products and fire-proofing materials manufactured by the company. In addition to product descriptions, the booklet contains photographs and biographies of the officers of the Milcor company.

FOUNDRY MELTING METHODS.—Whiting Corp., Harvey, Ill. A 52-page brochure on foundry melting methods that will be of value to all foundrymen. Cupolas, rotary furnaces, side-blow converters, air and cradle furnaces, and duplexing equipment are all thoroughly discussed and advantages of each type, and its particular field of application, are pointed out. Photographs and line drawings are used advantageously to illustrate the text.

MEASURING INSTRUMENTS.—General Electric Co., 1 River Road, Schenectady, N. Y. "When You Can Measure" is the title of this unusual booklet that tells briefly the contributions of GE engineers and scientists to the art of measurement. How instruments are designed, constructed and tested are discussed in detail and many striking photographs illustrate the text.

RADIANT TUBE HEATING ELEMENTS.—Surface Combustion Corp., 2375 Dorr Street, Toledo. Folder covers the application of horizontal gas-fired radiant tube heating elements to furnaces with and without controlled atmospheres. Operating data on clean hardening furnace and on drawing, annealing and normalizing furnace are given.

PILLOW BLOCKS.—Shafer Bearing Co., 35 East Wacker Drive, Chicago. Bulletin discussing Super Sealed roller bearing pillow blocks. Includes cutaway photographs, diagrammatic drawings, specifications, load ratings and descriptive text.

PNEUMATIC RIVETERS.—Hannifin Mfg. Co., 621 South Kolmar Avenue, Chicago. Portable and stationary pneumatic riveters are illustrated and described in this 12-page bulletin. Specifications are included.

INGOT MOLD LIFTER.—Cullen-Friestedt Co., 1300 South Kilbourn Avenue, Chicago. Bulletin covers multiple handling of ingot molds. Photographs showing actual operation included.

DIE WELDING. — Ampco Metal, Inc., 3830 West Burnham Street, Milwaukee. Ampcoloy 44, alloy designed for butt and flash welding die material. Physical properties, metallurgical aspects and service data are included.

▲▲▲ THE IRON AGE ▲▲▲

JUNE 23, 1938

ESTABLISHED 1855 Vol. 141, No. 25

Parallels Meet

AFTER what happened last week, I am firmly convinced that those early developers of projective geometry, Lobatchewsky and Riemann, were right. Parallel lines do meet, if they keep going long enough.

It was my privilege and pleasure to preside, last Tuesday, at an Industrial Conference in Detroit at which some 700 outstanding leaders of industry and labor met to consider the way out of our present unfortunate and unnecessary situation.

This meeting, sponsored by the Detroit chapter of the National Industrial Advertisers' Association, was addressed by Donald R. Richberg, former head of the NRA; Lewis G. Hines, National Director of Organization of the AFL, and Bennett Chapple, vice-president of the American Rolling Mill Co.

Where you could find three men of more widely differing spheres of experience and responsibility, it would be hard to say.

Richberg, a lawyer, former head of the NRA, a man who is a liberal in regard to economic legislation, who has sat in the inner councils in Washington, but who has kept his feet on the ground.

Hines, who began work at the age of 11 as an apprentice glass blower, left that declining industry to become a metal polisher, became general organizer for that craft, later Director of the Bureau of Mediation of Pennsylvania and is now National Director of Organization of the AFL.

Chapple, noted "Iron Master" of the Armco radio hour, who for 20 years has directed the publicity and the public relations of a company that has never lost a day's production in more than 28 years because of labor troubles.

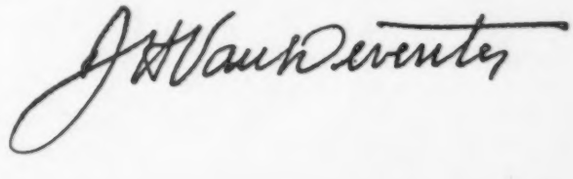
These men went to Detroit to present their views on what steps we should take to overcome the depression and recreate jobs in industry. Their papers were prepared independently of one another without any leading suggestions from the sponsoring committee. All that was asked of them was "Tell us how to get out of this hole."

You would have expected to find three widely differing opinions from these three men. But you did not. Instead, their thinking throughout ran in exactly parallel lines and hence in the same direction.

In a nutshell, it was this: We must get together on a common ground, for the purpose of making business better and creating jobs. There is no room on this common ground for "one man" or "one class" domination.

There are enough of us averagely well intentioned people in Government, in Labor, and in Ownership of Industry to attain that objective through cooperation and through consultation. If we will get together, we can disregard the few egomaniacs who in each of these spheres would rule or ruin.

You do not have to bend parallel lines to bring them together.

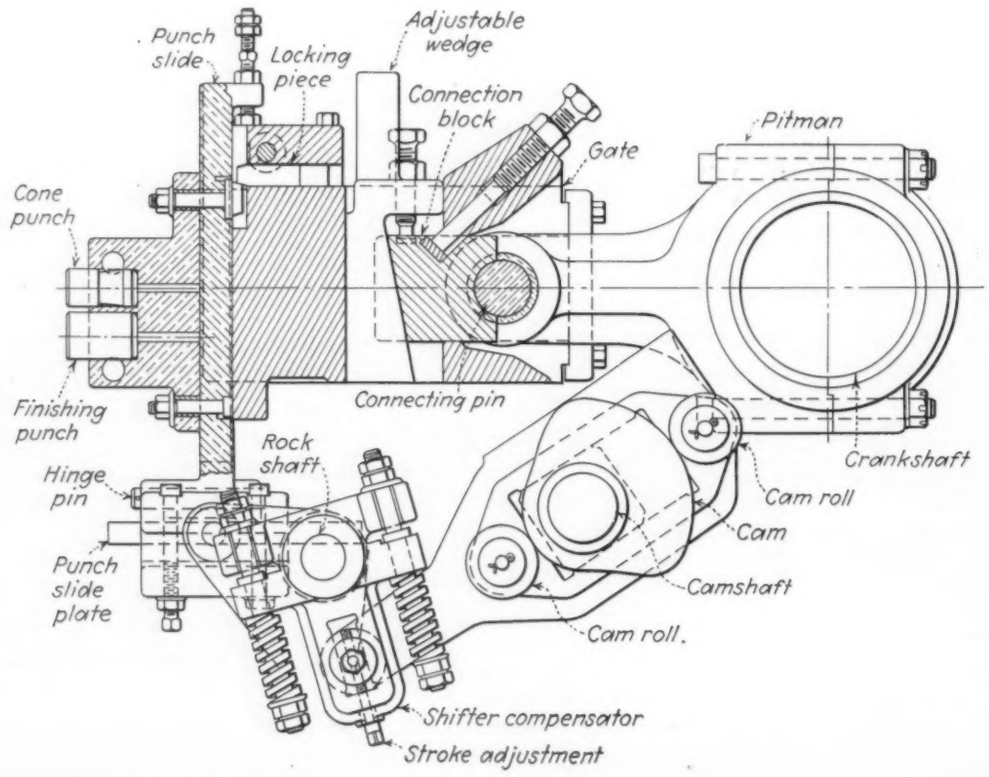


An Appraisal of Cold Heading

IN this second article of the series, the author reviews the general principles of operation of cold heading machines and distinguishes the design details of the three commercial types of equipment. Trends in speed and capacity are indicated by some headers placed on the market in recent months. A wire drawing attachment eliminates age hardening effects on cold drawn wire for heading work. The third article will discuss die material and its heat treatment, as well as general principles of die design. The first article appeared in the issue of June 9.

A COLD heading machine consists essentially of a roll feed for the wire, cut-off knife and transfer mechanism, and the header proper. The usual arrangement is a fixed set of dies and a reciprocating head or gate on which the punches are carried. Machines are made in single, double and triple stroke types, which means that it takes that number of blows with different punches to complete the piece. Quadruple headers combine two double stroke units. By far the majority of the work is done in two stroke machines, in which the first stroke is a coning or bulbing operation and the second, a finishing stage to the extent that a round head of final depth is formed. Hexagon or square heads are formed by trimming dies in a second operation, with hand or hopper feed. Extrusion of the shank to a smaller diameter than the wire can be accomplished in the fixed die in the header or during the subsequent trimming operation.

Dies are of the solid or open type. From solid dies, work is ejected by a knockout pin which is cam driven. Open dies are split vertically and are opened slightly at the completion of the finish stroke, allowing the part to be readily ejected. Long pieces tend to stick in a solid die, since there can obviously be no draft in a part having the character of a bolt or cap screw. Solid die headers are used for a large variety of comparatively short work and for pieces of accurate diameter, limited length and high quality of finish; consequently open die headers are used for proportionately long work, as well as for work on which the parting line produced on the shank is not objectionable. A new line of solid



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THIS Waterbury-Farrel heading unit and punch shifter is a typical design. For every stroke of the crank, the punch slide is alternately moved either up or down.

o o o

Practice — II

By FRANK J. OLIVER
Associate Editor, The Iron Age

die headers is being offered, however, to handle work with shanks 10 diameters in length.

Extrusion dies are necessarily of the solid type, but can be used in combination with open dies. Generally open dies are made up of two die blocks, with semicircular grooves in each of the four faces. At the time of heading, these dies are wedged in place solidly, and by matching up fresh sets of grooves and turning the blocks end for end, the die life can be multiplied by as much as eight times the life obtained from a solid die.

Because a header is always working up to the elastic limit of the wire material and beyond, the machines must be built extra rugged, with generous casting sections and oversize bearings. In addition, several safety features are incorporated. There is usually a shear pin or cast iron breaker plate in the cut-off mechanism between the eccentric crank plate and the cutting off slide. On the larger sizes, also, the knockout cam is actuated through a breaker plate. The frame may be of high tensile cast iron or cast steel. Crankshafts are generally heat-treated alloy steel.

There are three commercial heading machine manufacturers. Two of them, the E. J. Manville Machine Co. and the Waterbury Farrel Foundry & Machine Co., both of Waterbury, Conn., have made machines of this type for many years. The National Machinery Co., of Tiffin, Ohio, well known as makers of hot forging machines, is a newcomer to the cold heading field. All three companies make machines of the general design described above, the chief differences being in the method of cutting off the wire blanks, the means employed to shift the punches, the construction of the ejection or knock-out device, and the crankshaft mounting or support. There have also been some noteworthy modifications of the conventional design and these will be pointed out later.

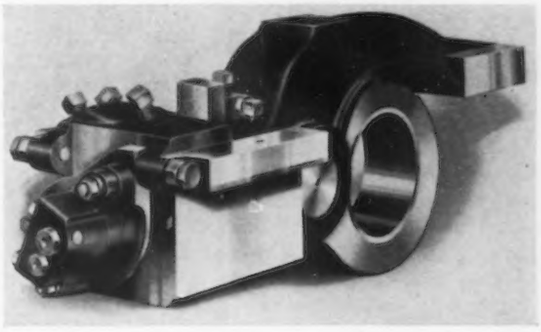
Gate Design

The vertically reciprocating slide, to which the punch holder is attached is a design common to both the Manville and Waterbury-Farrell headers, although the details vary. A cross-section of the latter's design is shown to illustrate the principle of operation. The heading unit on this two-stroke machine consists of a gate, a vertical punch slide dovetailed to the gate, a punch holder on the slide, a connecting rod or pitman with self-alining connection to the gate, and a punch shifter driven off a camshaft, which is geared to the crankshaft at half speed. The spring compensator and cradle connection to the slide takes up lost motion and provides for adjustment.

The heading tool movement on the National two-stroke machine is quite different. Instead of sliding up and down in a gate, the bolster is given an oscillating motion about a center. The bolster is automatically locked in each of the heading positions, and an automatic relief prevents damage to the bolster or tools, should any interference prevent the completion of its oscillatory movement. An oscillatory motion is also applied to the cut-off tool and carry-over motion. The cutter arm oscillates about a pivot point and is operated by a circular cam, timed to approach the stock at a slow speed without shock, and the action is said to be one of cutting rather than breaking off the stock. After the blank is severed, it is carried to the heading position by a gripper finger operated by another circular cam. Both cutter and gripper are protected by a relief device, rather than by a braker plate or shear pin. The same slow-start principle is applied to the work ejector cam so as to prevent up-

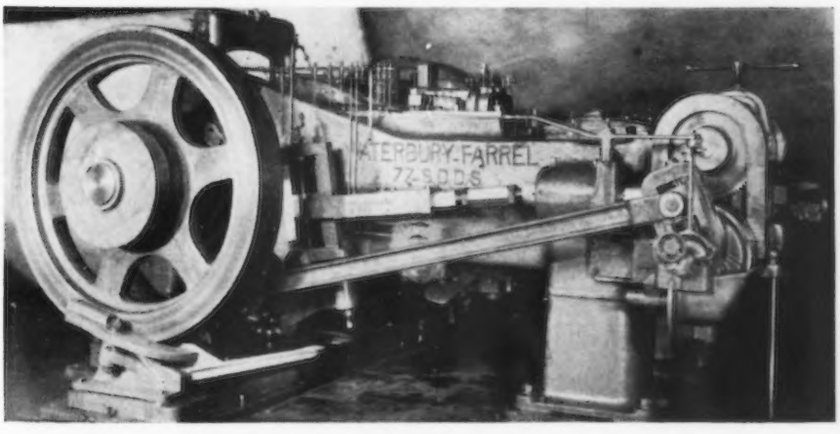
AT RIGHT

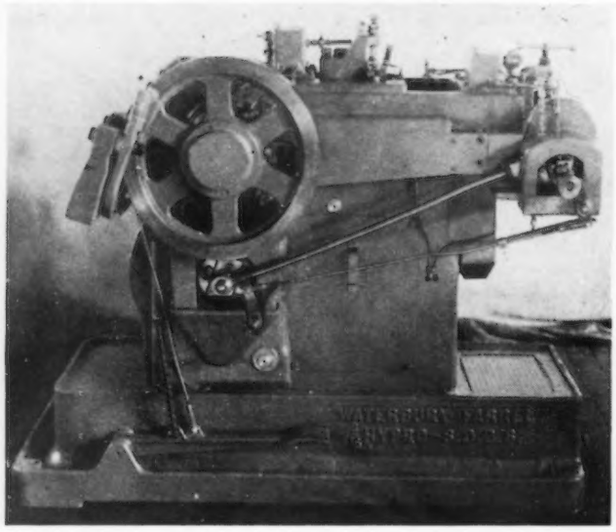
SOME distinctive features found in the National cold header are the long over-arm heading slide and the oscillating heading tool movement.



BELOW

THE Waterbury No. 77 1½ in. solid die, double stroke cold header is without doubt the largest ever built. It weighs over 66 tons.





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AT LEFT

OPERATING side of Waterbury-Farrel's new Hypro header capable of heading screw blanks from 3/16 in. wire at the rate of 225 per min.

o o o

setting the end of the work when the ejector pin comes in contact with it.

In the design of its cold headers, National has carried over a number of features found in its hot forging machinery, such as a heat-treated cast steel frame and a long overarm support for the heading slide. The overarm extends over and beyond the crankshaft, giving bearing support to the slide on both sides and assuring alinement at all times. Another innovation is the location of the feeding mechanism at a slight angle to the machine so as to compensate for the dragging action of the shear blade and thus get a more nearly square end of the blank.

Cold headers range in capacity from ⅛-in. wire to 1½-in. rod. Waterbury-Farrell is the only company making a machine above 1-in. bolt size. One of its latest machines of largest capacity, a 1½-in. solid die double stroke machine, weighs over 66 tons, is driven by a 75-hp. motor and has an output of 35 pieces per min.

High Speed Types

By contrast, the latest Waterbury-Farrel high-speed "Hypro" header is a double-stroke, solid die machine that delivers 450 blows per min., or 225 pieces, on the smaller size, which has a capacity of 3/16-in. wire and work up to 1 in. long under the head. The belt driven machine weighs 3300 lb. National's ⅛-in. high speed machine weighs 2200 lb. and delivers 250 pieces per min.

The manufacturers state that special attention has been paid to the safe and efficient operation of the machines at these high speeds; that they are unusually well-guarded, automatically lubricated, and provided with mechanical safety devices which contribute materially to their high efficiency.

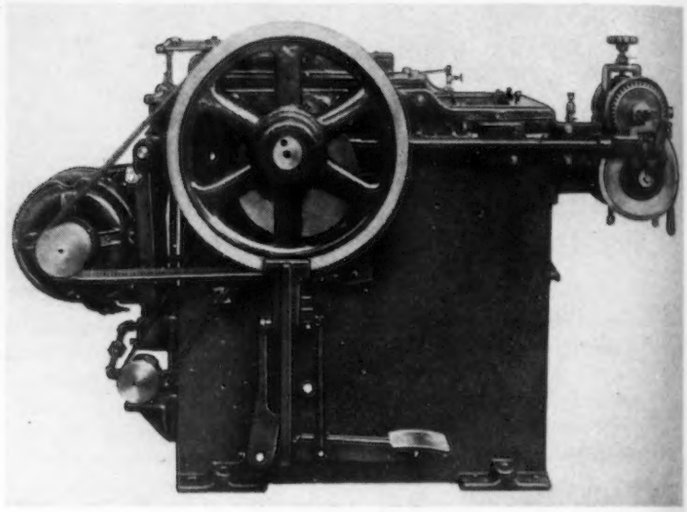
The roll feed on the Hypro is provided with an auxiliary mechanism which makes it impossible to feed a shorter length of wire than needed. The device which cuts off the wire and transfers the blank into heading position has also been especially devised for high speed. It is adjustable for timing and for locating the knife relative to the dies. Similar features are also found on the National high-speed header.

Waterbury-Farrel has also recently redesigned and strengthened their standard line of solid die, double stroke headers in seven sizes from ¼ to 1½ in. to meet the requirements for cold heading high carbon alloy steels at high speed. These changes include the use of an entirely new frame of extra large cross-sectional area and an improved cut-off mechanism.

The cut-off bar is large in diameter and operates through the frame at right angles to the wire, with its inner end supported in such a way that the knife is held flush with the face of the die, thus assuring a clean shear. The hinged "fiddle bow" formerly used to hold the blank in the cut-off knife, has been replaced by a spring finger fastened to the knife.

New Ball Headers

Manville has recently announced an interesting addition to their header line. The machine, known as a ball header, forges steel balls and is a solid die type, single stroke. According to the maker, balls shaped by this header require about 50 per cent less grinding than is now necessary with any other machine of this type. This is due to the design of a new magazine quill cut-off which permits a perfect right angle cut, thereby keeping the finished blank within exceptionally close tolerances. In producing ⅛ or 7/32-in. balls, a product rate of 350 per min. has been achieved, the highest speed ever attained with this type of machine. Features include an accurately balanced crankshaft and forced feed lubrication.



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AT RIGHT

THIS Manville ball header is a single-stroke type capable of producing 7/32 in. balls from cold drawn wire at the rate of 350 per min.

o o o

Tubular Rivet Headers

Another new header made by Manville is a machine that produces tubular rivets in a single station operation of two blows. The machine is unique in that it performs the difficult operation of punching an extended hole in the blank while it is held in the same position it occupies when it is headed. This eliminates transferring the work from one set of tools to another. The normal rate of production is 150 blanks per min., the maximum size of

which is 3/16 x 5/8 in. With a few minor changes, such as the fitting of new dies, this machine may be used to form a large variety of metal parts.

Waterbury-Farrel also make a tubular rivet header. One recently placed on the market is essentially a modified solid die, double stroke toggle header with special attachments. This machine employs one set of tools for making the head in two blows, and an additional set for forming the tubular portion, both sets working simultaneously on successive rivet blanks. The special equipment includes a spring finger transfer mechanism to carry the work from one die to the other. This method of manufacture is feasible where the depth of the hole does not exceed one wire diameter. For longer holes, a secondary drilling operation is required. This machine is made in two sizes to make rivets 1/8 x 5/8 in. or up to 3/16 x 3/4 in. Production is 100 pieces per min.

Wire Drawing Attachment

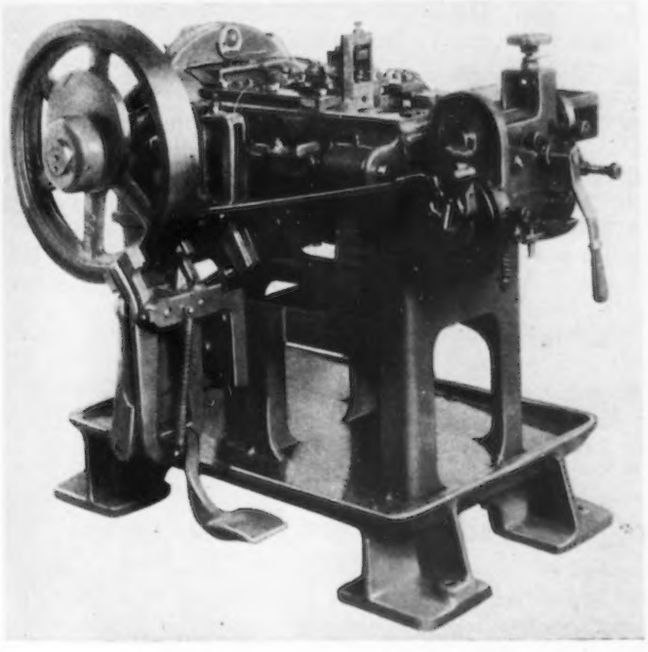
There are two types of attachments made for wire drawing hot rolled rod immediately before it is sent into the headers. The Ajax Hogue machines, made by the Ajax Mfg. Co., Cleveland, are in wide use. A newer type is made by the B-W Mfg. Co., Detroit. Such a device enables the user to purchase the cheaper rod material in place of cold drawn wire, and simplifies stocking, since one base size of rod can be drawn to several diameters. Principally, however, the advantage lies in eliminating the aging effect of cold worked material. If cold headed immediately after being wire drawn, the material exhibits a plasticity close to that of the original hot rolled stock, and subsequent heat treatment of the cold headed product is frequently not necessary, even for the SAE 1035 steels. If cold drawn wire is allowed to stand unworked as little as 20 min., on the other hand, a difference in the physical characteristics will be noted. (The same aging effect is seen in severely cold rolled sheets, which are re-worked cold by the roller leveler process.

Using this technique, the life of the cold heading dies is said to be greatly improved, running as high as 250,000 pieces, compared with 50,000 where cold drawn wire is used that has age hardened. Questions of straightness and wire lubrication also enter here. Another economy claimed for the machine is that the rod does not have to be pointed and can be started through the machine very quickly.

The B-W attachment incorporates a pushing mechanism to start the rod through the drawing die, which is a conventional tungsten carbide type, and an intermittent pulling mechanism operated through rocker arms and links. This unit replaces the continuous roll feed mechanism of a header and can be applied to any standard machine. The rod is fed by hand into the pushing grip mechanism directly from the reel and the machine started. The first or second push gets the rod started through the drawing die, and when the wire comes out, it is carried into the second grip mechanism, which takes hold and begins to pull. The push mechanism may then be disengaged. The speed of drawing is only about 12 ft. per min., as compared with 250 ft. in ordinary wire drawing benches, so that the heating effect is slight and the life of the drawing dies is greatly prolonged. Some dies have drawn as high as 800 tons of wire before being discarded. The average reduction is 0.060 in.

Toggle Type Machines

In the cold forming of hard metals like steel, time is an element. For intricate work, in order to give the metal a chance to flow, a machine with a toggle press action is sometimes more advantageous than a faster crank-type machine, such as those that have been described. A standard upright toggle press is usually employed, but obviously a wire feed from coil stock cannot be used. As most of this work is second



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AT LEFT

A MODIFICATION of a standard header is this Manville hollow rivet machine, a two blow, single station type. Production is 160 blanks per min.

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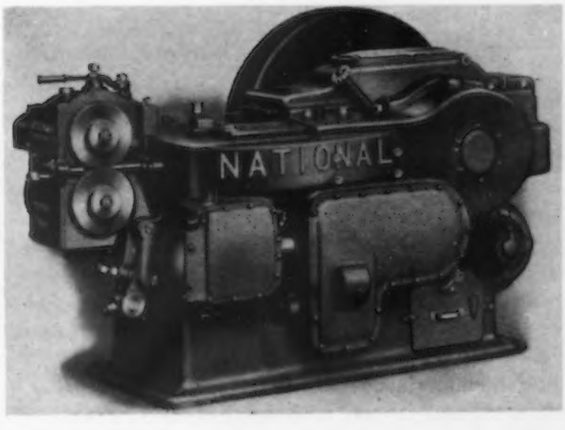

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AT RIGHT

A FEATURE of the National line is the almost complete enclosure of all moving parts.

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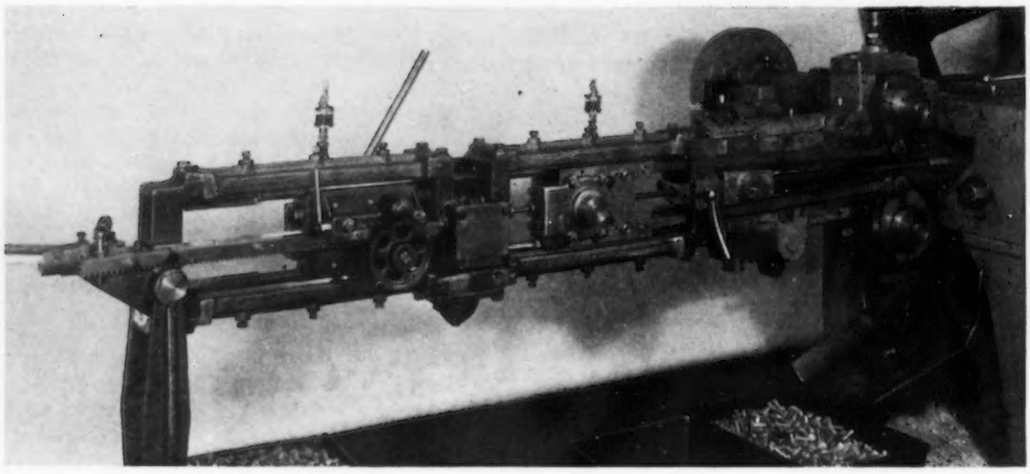

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ONE of the latest advances is the B-W wire drawing attachment for cold headers that permits rod to be cold drawn immediately before being cold headed. A pusher, left, starts the rod through the drawing die and a reciprocating puller takes it up on the other side and feeds it directly into the header.

o o o

operation processing, this drawback is not serious.

A machine closely allied to bolt headers is an automatic nut forming machine made by Waterbury-Farrel. This machine cold upsets double chamfered hexagon nut blanks from wire stock with a minimum of scrap. There are four punches and four dies arranged in a horizontal plane, and the work is transfererd automatically from one to the other in succession. After the blank is cut off, it is squared up by a punch, then transferred to the second die and a dome or cone shape formed on each end of the blank. In the third die, the hexagon shape with chamfer on both sides is formed, as well as two central recesses. These depressions form countersinks for the hole that is punched through in the last die, and the slug or scrap is only about half the thickness of the nut. The nut blanks are delivered through a tube, free from scrap. Production is 80 nuts per min. on the ½-in. size machine, and 100 on the ⅜-in. machine. Usually a high sulphur, basic open hearth steel is used to facilitate the subsequent tapping operation. High production, a homogeneous grain structure, excellent finish and low cost are some of the advantages pointed out by the manufacturer.

Other nut machines are made that employ punching and stamping methods, without there being any attempt to upset or cold form the original stock, and hence are not pertinent to this discussion.

In bolt and cap screw departments, aside from the cold headers, there are a number of pieces of related machinery that govern the layout, generally from the point of view of efficient flow of materials. Some plants use a departmental layout, with headers in one group, trimmers in another, roll threading and cut threading, heat treating and plating in other sections. This is the commonest arrangement found in bolt factories. One of the large electrical equipment manufacturers, however, has a group of headers in one row and a line of slotters across the aisle. Behind them is a smaller number of thread rollers and tumbling barrels for removing burrs. The thread rollers face a double deck gravity roller conveyor leading to the washer and heat-treating furnaces in the same room. Another section in the same department has a group of larger headers, with trimmers for forming the hexagon heads, shavers, pointers and slotters grouped behind them in the other aisle. Another roller conveyor takes the bolts in tote boxes to the thread rollers in the main aisle.

One of the most efficient layouts is found in a motor car plant. On a mezzanine deck is a battery of cold headers used to cut off and size wire for cylinder head studs. Blanks ejected from the headers are led by tubes to two thread rollers, one above the other by an arrangement of heavy I-beams. After being roll threaded at one end, the stud is fed by pipe to the second threader, but on the way it is upended by a rocking fixture. The set-up is entirely automatic and produces 450,000 to 500,000 studs in 24 hr.

Although tote boxes and lift trucks are commonly used in bolt departments, conveyors are coming into wider use, particularly in the packing end of the line. The most efficient manner for transporting coil stock to the cold headers is by overhead monorail, and this is the method used by some of the largest manufacturers. Since changeover time is a factor in hourly output, the tendency is to use heavier coils, weighing up to 600 lb. or more, in place of conventional 200-lb. coils.

(*To Be Continued*)

Fire Clay Ladle Sleeves Tested

THE National Bureau of Standards has just published the results of a study to determine the best fire clay ladle sleeves for steel foundry service. The results obtained may be summarized in part as follows:

The brand of sleeves which gave the most satisfactory results in service was very refractory, had fairly high porosity, a fairly uniform and not high expansivity, and a moderately high extensibility.

A great deal of variation in the properties and service results was noted in different sleeves of some of the brands indicating lack of uniformity in the product.

There is a sharp dividing line in the degree of refractoriness between the two brands of highest refractoriness and the remainder of the brands. It would appear desirable to specify a refractoriness requirement. The specified pyrometric cone equivalent expressed in approximate temperature equivalent should be greater than, or at least equivalent to, the maximum temperature of the molten metal as it enters the ladle. It would also seem desirable to specify a porosity requirement of not less than 15 per cent. A minimum extensibility value and a linear thermal expansion without erratic changes due to silica inversions are also possible and desirable requirements. If a refractoriness requirement is specified, not much appears to be gained by specifying limits in the chemical composition.

Effect of Chromium on Growth of Commercial Cast Iron

By REBECCA HALL SMITH
Metallurgist, Detroit

IN the issue of June 9, Mrs. Smith reviewed the history of investigations of the growth of cast iron at elevated temperatures and detailed her attacks on the problem. Herein, the author's report is concluded with an outline of her own ideas on the causes of growth, together with a summary of data on the retarding action of chromium.

IN the author's opinion, the growth of cast iron on exposure to elevated temperatures is due to:

I. First, the decomposition of cementite and pearlite into ferrite and graphite. Although not the principal cause of growth, this is the first step in every iron with which the author is familiar, which has been exposed to temperatures above the pearlite decomposition point (about 800 deg. F.).

The breaking down of cementite and pearlite aids growth in the following three ways:

(a) The decomposition products, ferrite and graphite, take up more space than the constituents originally present.

(b) The graphite formed offers ingress to oxidizing gases.

(c) The decomposition products are mechanically weaker than the cementite or pearlite, and therefore more likely to crack under the strains set up by different expansions and contractions.

II. Second, oxidation. In most service, this is the principal cause of growth, for the following two reasons:

(a) The silica and iron oxide formed by the oxidation of silico-ferrite are much more bulky than the latter, and therefore tend both to increase the volume of the casting directly, and by exerting pressure which may cause cracks;

(b) The gas formed by the oxidation of graphite exerts pressure, causing the formation of tiny fissures along which more oxidizing gas can enter.

Oxygen is present in the air around castings all the time; but it does not cause their rapid deterioration except at high temperatures, because it cannot penetrate into the interior of the metal. However, as cast iron is heated, it expands; and because iron expands at a faster rate than graphite, small cavities are formed along the graphite flakes. It is along these cavities that oxidizing gases enter.

At any one heating, probably the oxides produced would eventually fill the cavities around the graphite flakes, and thus effectively prevent further oxidation. With alternate heating and cooling, however, there is a cycle set up: the oxides formed at high temperatures interfere with contraction as the iron is cooled; cavities open up as the iron is re-heated, oxidizing gases enter, more oxides are formed, and the iron thus continues to grow. For this reason, the alternate heating and cooling such as commonly occurs in industrial applications, causes much more rapid growth than would take place if the casting were simply raised to a high temperature and held there.

In the photomicrographs (see issue of June 9, page 45), the oxides are gray, while the remaining graphite is black. The swollen appearance which characterizes graphite formations in

oxidized irons appears to be due to the formation of oxides of iron and silicon in the immediate vicinity of the graphite flakes. Naturally, if the oxidizing gases enter along the cavities by the graphite flakes, they would attack first those portions of the casting which are near at hand; and the gray oxide formed would, at low magnifications, give the appearance of swollen graphite. A secondary cause for this swollen appearance may be the depositing of graphite from carbide decomposition.

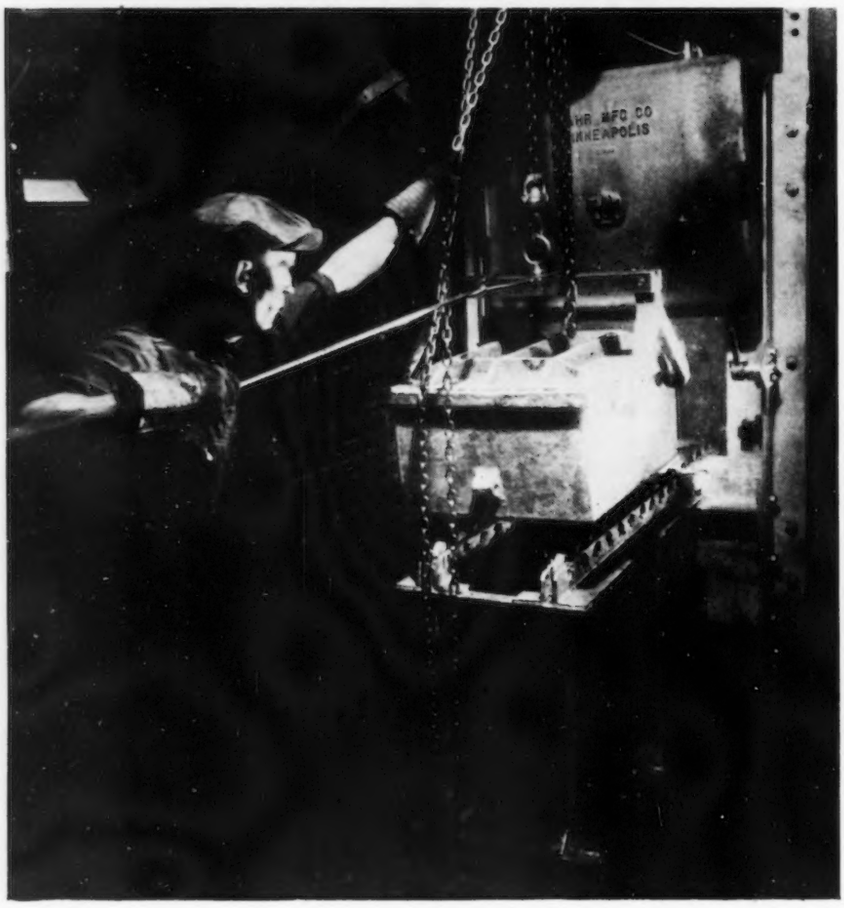
III. Third, expansions and contractions. These may be purely physical, chemical, or allotropic in nature.

(a) *Physical:* When cast iron is alternately heated and cooled, even at temperatures under 800 deg. F., a permanent growth takes place, due to the expansion and contraction of the casting. Pure iron expands when heated, but since it contracts an equal amount on cooling, there is no permanent change in volume. Commercial cast iron, however, is a discontinuous material, made up of two or more constituents which each have a different rate of expansion. When heated, each of the different constituents expands at its own rate, and stress is set up between the various micro-portions which results in cracks. In an oxidizing atmosphere, these cracks offer easy ingress for oxidizing gases, and thus increase oxidation; but even in a non-oxidizing atmosphere, these cracks contribute to the increase in volume and deterioration of the casting.

(b) *Chemical:* At temperatures between 900 deg. and 1300 deg. F., the decomposition of pearlite, producing ferrite and graphite, takes place. This reaction, which has such a marked effect on growth, was discussed in detail above. One type of iron recommended for heat-resistance has eliminated this factor, because it is all ferrite and graphite as cast.

(c) *Allotropic:* The change from alpha iron to gamma iron, at about 1340 deg. F., is accompanied by a marked change in volume. Each time the casting passes through the range including this temperature, the expansion or contraction which occurs causes severe strain. Another type of heat-resistant iron eliminates this factor, by being austenitic as cast.

The author recognizes that the temperatures and atmospheres involved may cause one or another of the factors mentioned above as causes of the growth of cast iron, to be the most important for that particular service.



LAMINATIONS for Ohio Electric Mfg. Co. motors are made uniform throughout in this special annealing operation.

Effect of Chromium

From the photomicrographs (see issue of June 9, page 45), it is easy to obtain a clear picture of the role of chromium in retarding the growth of gray cast iron.

I. Chromium stabilizes both cementite and pearlite, interfering strongly with the graphitization which would, in unalloyed irons, take place at high temperatures. As is evident from the photographs, both massive carbides and pearlite remain intact, even after exposure to 65-hr. cycles at 1700 deg. F., far above the decomposition range of unalloyed pearlite. It has been stated in the past that a carbide-forming element stabilizes the massive carbides, but that the presence of silicon prevents its stabilizing the pearlite.[14] The present author can see no difference in this respect between the massive carbides, and the carbide in the pearlite. Obviously, from the pictures, the pearlite is stabilized, with the following results:

(a) It does not form bulky decomposition products;

(b) Since graphite is not formed, there is less ingress for oxidizing gases;

(c) The structure of the casting still consists of strong pearlite, which can better withstand the stresses set up by different expansions and contractions.

Several years ago, when investigating the effect of chromium on malleable iron, the author found that even when additional silicon was added with the chromium, the latter still stabilized the pearlite.[15] As little as 0.22 per cent chromium would retard graphitization of white iron during a

[14] "Dilatation of Cast Iron During Repeated Heating and Cooling," by J. H. Andrews and R. Higgins, *Journal Iron and Steel Institute*, Vol. 112, p. 167, 1925.

[15] "High-Strength and Wear-Resistant Malleable Castings," by Rebecca Hall, American Foundrymen's Association, 1933.

[16] "Effects on Cast Iron of Prolonged Heating at 800 Deg. to 1100 Deg. F.," by R. S. MacPherran and R. H. Kruegar, Transactions, American Foundrymen's Association, vol. 38, p. 826, 1930.

10-day annealing cycle, resulting in a structure of nodular temper carbon in a pearlitic matrix, instead of a ferritic one.

II. Chromium retards oxidation. It is well known that when large amounts of chromium are present in ferrous metals, it forms (under oxidizing conditions) a protective film of chrome oxide. The photomicrographs show clearly that neither the matrix nor the graphite of the chromium-containing iron were attacked appreciably by oxidation, although exposed for 300 hr. to an oxygen atmosphere at 1700 deg. F. It is the author's belief that the chromium in this iron, although only 1 per cent was added, acts in some such manner as the chromium in the stainless steels: that when oxidizing gases enter (as they must, to some extent), the chromium reacts with them, forming minute layers of oxide, probably following the lamellae of the pearlite, and effectively preventing further oxidation. There is, also, the further consideration that the chromium iron originally had smaller graphite flakes, which would offer less entrance to gases.

III. Chromium strengthens the iron, and thus makes it more able to withstand the stresses set up by thermal changes. As brought out before, the chromium-iron is stronger than unalloyed iron at room temperatures. MacPherran and Krueger[10] have shown that it is stronger when tested at high temperatures; and after cooling, the tests cited earlier in this article showed it was several times stronger than unalloyed iron. It is therefore better equipped to withstand the inevitable strains resulting from alternate heating and cooling.

In summation, the three main causes of the growth of cast iron after exposure to elevated temperatures are, in the author's opinion, (1) carbide decomposition, (2) oxidation, and (3) expansions and contractions. Since chromium in cast iron stabilizes the carbides, retards oxidation, and strengthens the iron, its retarding effect on growth is explained.

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(14) T. J. Wood, "Growth of Gray Cast Iron," Iron Age, vol. 132, p. 12, July 20, 1933.

(15) H. Thyssen, "Influence of Silicon and Aluminum on the Resistance of Cast Iron to High Temperatures," Journal Iron and Steel Institute, vol. 130, p. 153, 1934.

Patents Issued for Changing Cold Metal Into Open Hearth

PATENTS on a process and the apparatus for mass charging of cold metal into open-hearth furnaces through improved furnace construction have been issued to Paul H Douglas and John F. Rogers, Cleveland Heights, Ohio, assignors to the Wellman Engineering Co., Cleveland.

Through charging in large bulk at one time, reductions in power and fuel consumption are aimed at, along with speed of operation and savings in the maintenance cost of the charging equipment, as well as the furnace itself.

Reconstruction of the front of the furnace is the principal feature. The furnace is fitted with a removable front which is substantially as long as the hearth and which can be readily extracted and lifted and replaced so as to admit of the insertion of the charging pan or receptacle having a floor area similar in size to that of the furnace hearth, thus enabling the entire hearth to be filled with cold metal or other material in one charging operation.

At the same time, the furnace front is provided with hot metal and inspection doors arranged and functioning as in the usual open-hearth furnace. This provision of a removable furnace front comparable in length with the furnace hearth, and the provision thereon of individually movable doors similar to those in use on the non-movable or permanent open-hearth furnace front, the extracting and lifting mechanisms for the furnace front, and the operating devices for the various doors, each capable of functioning without interference with the other, constitute features which are new.

The charging equipment consists of a charging machine proper constituting one unit, and a suitable receptacle or pan having a flexible rolling bottom with a floor area substantially equal to the entire hearth area to be charged, which may be loaded with the cold metal charge at any suitable point and brought up to and deposited on the cradle of the charging machine which can then be moved along the track in front of the furnace to be charged, and after the charging operation is completed, the empty pan may be removed from the cradle and again filled with cold metal.

In charging a furnace, when the charging machine has come to a stop, the furnace front is removed and the cradle and the loaded pan are run into the furnase the full distance, then retracted, and, while being retracted, the pan floor is caused to roll underneath the pan frame, the rear wall of the pan then being held stationary and after the entire charge is deposited progressively on the hearth in a layer of approximately uniform thickness, and while the platform and cradle are still being retracted, the pan floor is rolled back onto the upper side of the pan frame.

When the cycle of operations is completed, the empty pan may be again transferred to the hoisting mechanism, lowered onto the transfer car, and refilled for charging another furnace.

The engineers point out that the improved charging process obviates the necessity of cutting the scrap to the relatively small charging box size required by the dimensional limitations of the furnace doors, and to make possible the filling of each box with a sufficient amount of metal.

Also, it is asserted that the rapidity with which it is possible to fully charge the largest furnace by the new method reduces the time per heat with a resultant increase in tonnage in a given time.

Structural Welding Progress

By DIPL.-ING. O. BONDY
Consulting Engineer, London, England.

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THE first all-welded buildings in Germany, as in other countries, were very similar to their riveted predecessors. The designer in those times was mainly concerned with redesigning the connections only, while the members of the structure were of about the same shape as before. Later on it was found that considerable advantage could be derived from the natural rigidity of the welded joint and that certain types of structures could easily be adapted to the principles of rigid design.

Buildings of the rigid frame type became more and more predominant in Germany within the last years. Most of these structures are statically indeterminate; they are usually of the two-hinged frame type and have been found to be satisfactory not only in appearance but also in economy. On the way from any frontier station to Berlin one may find a number of all-welded railroad station buildings, and at Berlin itself one can inspect about a dozen of them within a distance of a few minutes' railroad journey from each other.

In Germany the greatest encouragement to structural welding has been given by the biggest steel consumers, namely the German State Railways. There can be no doubt that the railroads in introducing welding on such a large scale were not interested in any particular method of erection but only in achieving better technical and economic results by welding instead of riveting and bolting as previously employed.

THAT the welding of buildings in Germany has become well-established practice is apparent from this interesting second article by Mr. Bondy. Although most of the structures illustrated are for railroad purposes, there has been similar progress in factory and office buildings. The previous article of this series, in The Iron Age of June 2, was devoted to research and design.

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Three Main Types Welded

It is remarkable that in various countries different types of steel structures are preferred for welding. After a number of years of structural welding these differences are becoming clearly apparent. Generally speaking three main types of buildings can be distinguished as shown in Fig. 1. In Germany, structures consisting mainly of rolled steel beams and columns (type *a*) are rarely welded. On the other hand great numbers of them were erected by welding in other countries, especially in the United States, and also quite recently in Italy. Considerable saving in weight and cost is claimed for the welded construction but it appears that very elaborate details have to be worked out for erection on site to make it favorably com-

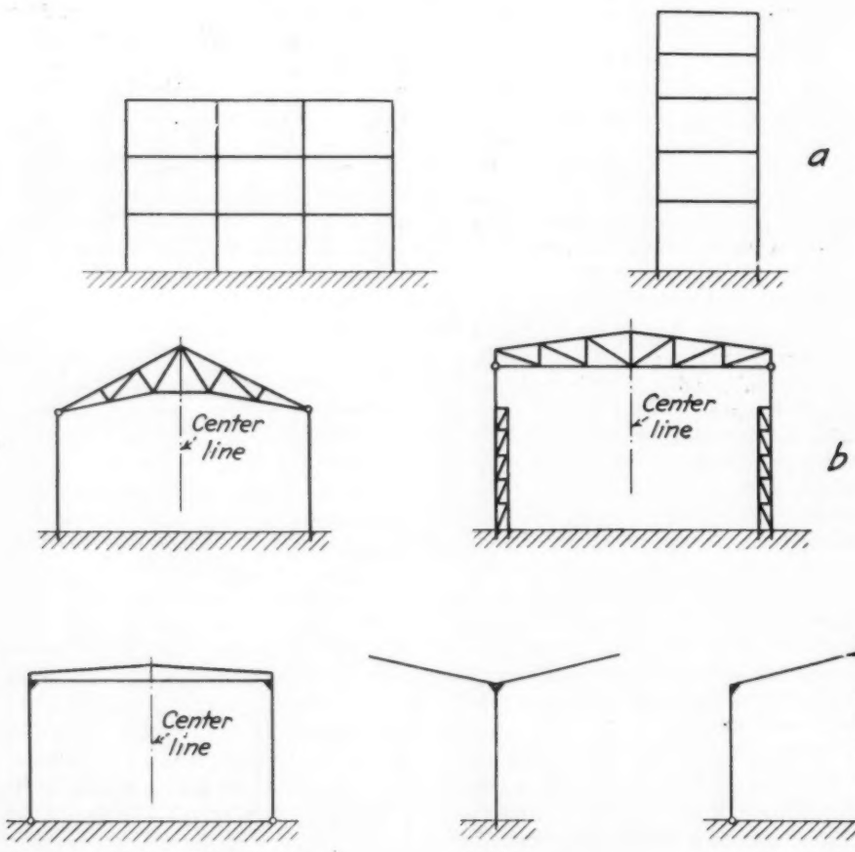

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FIG. 1—Three types of welded buildings.

o o o

in Germany

Part II — Rigid Frame Building

pare with the simple methods of bolting.

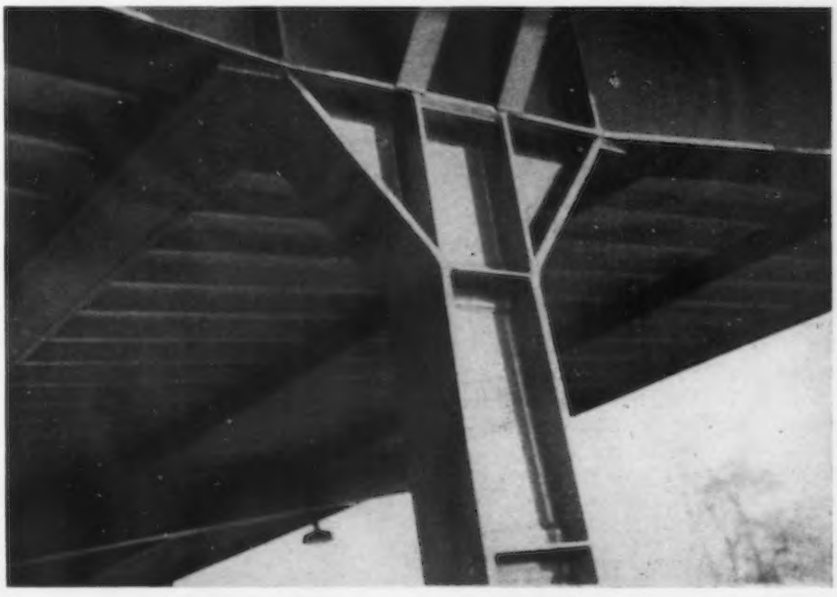
To the second group (*b*) belong buildings with truss roofs which were often welded especially in the early years of structural welding practice. But later on trusses were found to afford only limited advantages when welded instead of being riveted. There can be no saving in weight with the compression members which comprise the greater portion of the total weight. It is only natural that contractors and consumers alike are attracted by the maximum amount of saving in steel and in cost.

Structures of the rigid frame type as shown in group (*c*) belong to the favorite types of all-welded structures in Germany. These rigid frames consist either of rolled steel sections or of plate girders of varying depth following as closely as possible the maximum bending moment diagram.

Maximum of Clear Space an Objective

In present-day practice in Germany straight lines and sharp corners of steel frames are favored, thus doing away with all intermediate supports and unnecessary bracing. With many of the biggest welded structures in Germany the point of view of appearance was much in the foreground. Modern architects are generally in favor of rigid frame structures which give them so much more clear space as compared with truss type buildings.

As regards buildings of group (*a*), American practice has obviously succeeded in making the welding of these structures a paying proposition. Similar conditions appear to prevail with



ABOVE

FIG. 2—Main joint of an umbrella-type girder, Schöneberg station, Berlin.

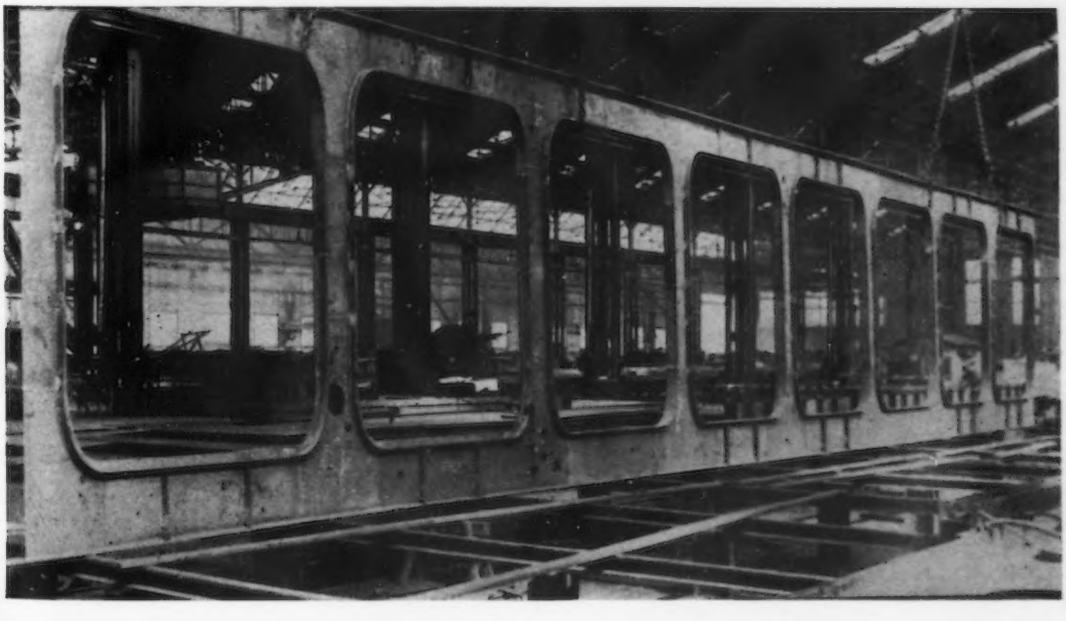


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FIG. 3—Vierendeel girder of 70 ft. span, Duisburg central station.

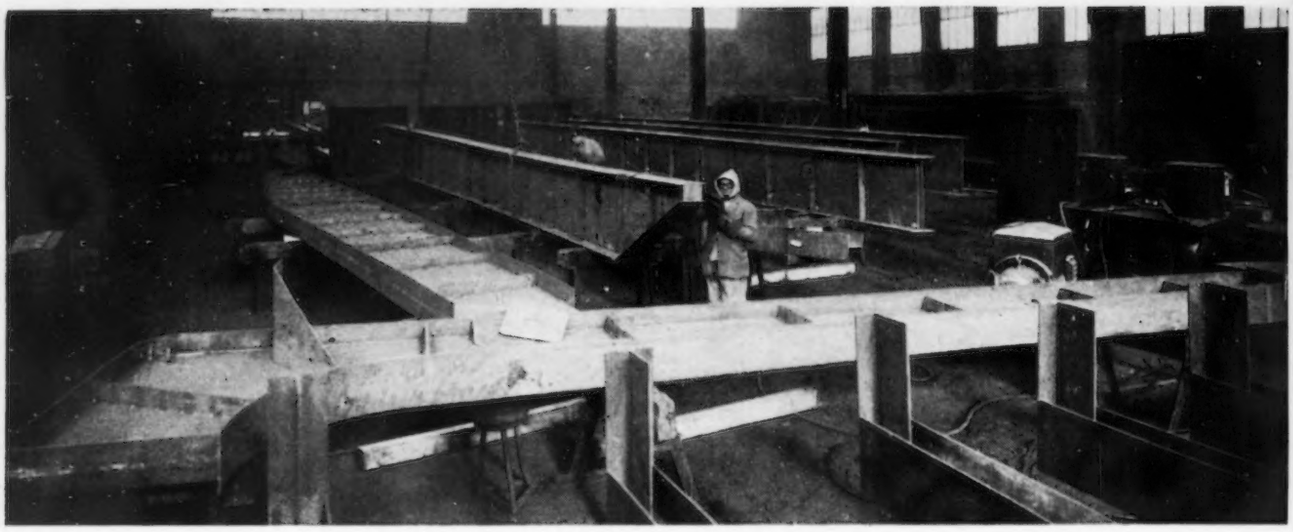


FIG. 4—Interior view of the Harkort workshops, Duisburg.

structural welding in Italy, Belgium, etc. To the writer's mind other types of buildings, especially those of group (*c*), lend themselves better to welding. Although means have been found to dispense with bolt holes for erection purposes it can hardly be expected that assembling methods without bolts will be as safe and economical. But for this kind of structure welding can prove extremely useful in doing all the shop work in connection with seat angles for beams and columns, especially in case of irregular and skew joints. Saving is also effected by fabricating the beams and columns themselves by welding instead of riveting. Even automatic welding might prove very useful in such cases. With buildings of the types shown in group (*a*) the main economy which can be achieved by welding does not so much concern the joints but the members themselves.

Riveted Trusses Used With Welded Frames

With structures of the truss type an average saving in weight up to 10 and 15 per cent has been effected as compared with the riveted construction. By the German Regulations for Welded Steel Structures[1] a maximum tensile stress in the butt weld of only 75 per cent is allowed as compared with that in the parent metal. Butt welded joints in tension members must therefore be provided with splice plates carrying 25 per cent of the member force. In case of compression members 85 per cent of the member force may be transmitted through the butt weld itself while for the remaining 15 per cent splice plates are again necessary.

Owing to the above mentioned limits for all-welded trusses it was often found economical to combine riveted trusses with welded plate girder frames in the same building. This was the case with a freight shed for the German State Railways recently erected at Hanover. The roof girders of 91-ft. span are of welded plate girder design with a sky light on top. They are supported on riveted trusses of 104-ft. span, carried by all-welded columns.[2] Such combinations of welded and riveted portions within the same building are claimed to be the most economical at present under certain conditions.

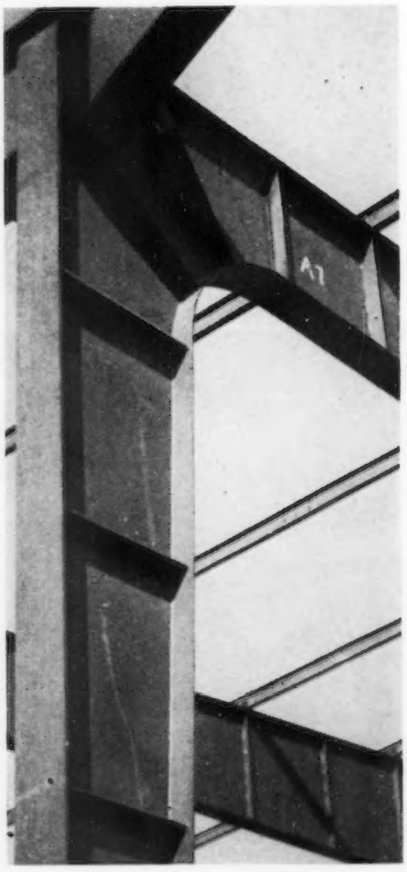


FIG. 5—Rigid frame corner of a 68-ft. span frame, Harkort, Duisburg.

Box-Type Truss Sections Developed

New types of sections were also introduced for welded trusses, for instance hollow box type sections which were patented to a contractor's firm at Leipzig. These sections, mainly of rectangular shape, offer the advantage of a great moment of inertia. The joints are arranged by means of projecting gussets and the whole construction forms a water-tight unit which can easily be preserved against corrosion.

In many cases tubular members have shown considerable advantages with welded trusses.[3] A number of welded structures consisting mainly or partly of tubular members have been erected to the author's design in Germany, France and England. Although the price of tubes which is roughly about twice that of rolled steel is still prohibitive in many cases, tubular members can be used as compression members in welded structures with considerable advantage where special conditions prevail.

Railroad Station Structures Welded

The third group of welded buildings (*c*) comprises those consisting of

[1] DIN 4100, August, 1934.
[2] G. Schaper, Bautechnik, Berlin, 5. February, 1937.
[3] Hilpert-Bondy, VDI-Zeitschrift, I. July, 1933.

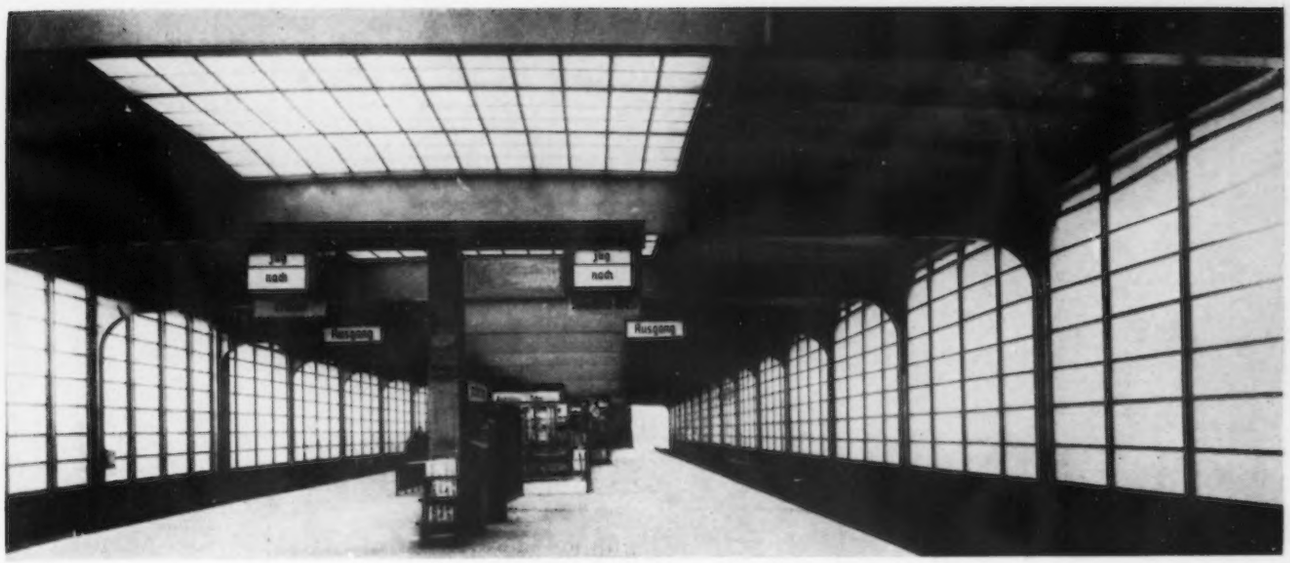


FIG. 6—70-ft. span frames at the Zoo station, Berlin.

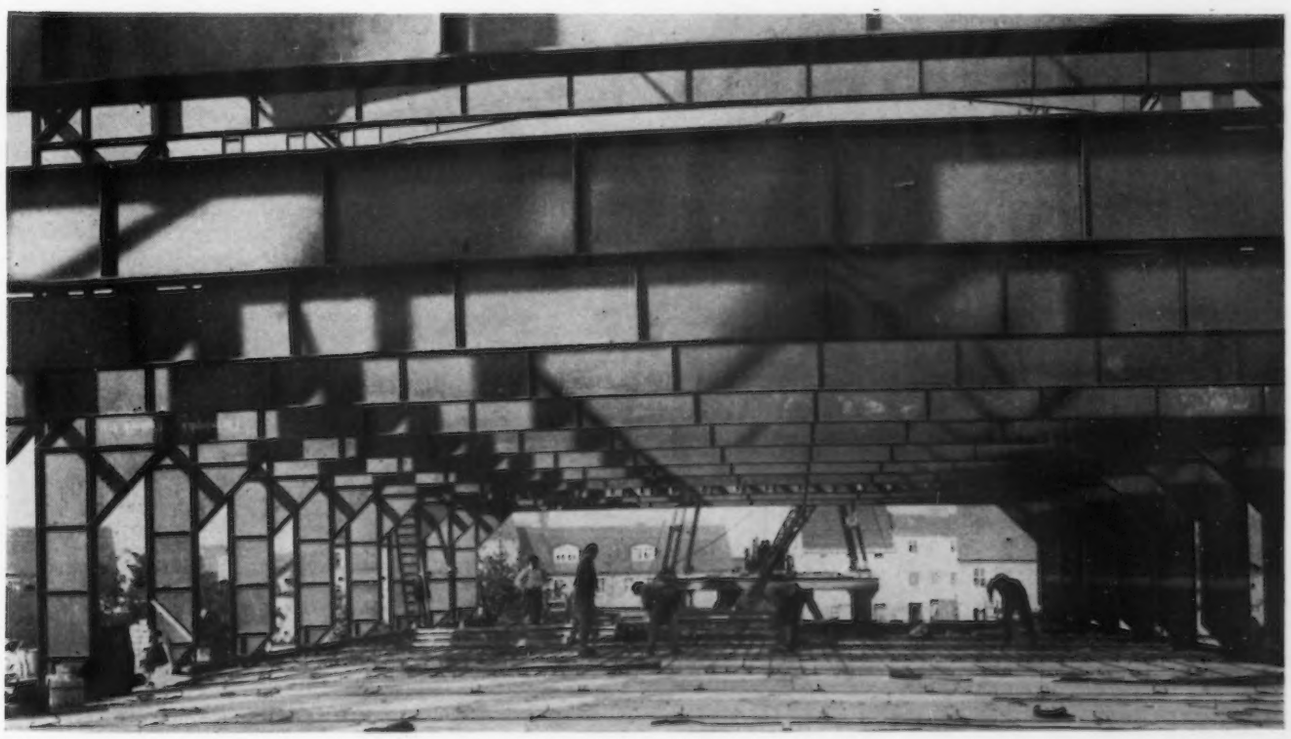
solid web members, either rolled steel sections or plate girders, with welded corner joints of full strength, thus forming a rigid frame. As these types of buildings are widely applied in Germany at present and certainly have found much wider use than the types of groups (*a*) and (*b*), some notes on recent developments may be of interest. Station roofs of the umbrella type were erected in great numbers in Germany to a more or less standardized design. The vertical upright is restrained in a concrete block at the bottom and the structure is in all parts exposed to bending which makes it specially suitable for the application of welding.

Cross sections of rigid frame stations are shown in Table 1. The umbrella type structure has been carried out in great numbers also for suburban stations near Berlin. Fig. 2 shows the top joint of such an umbrella roof at Schöneberg, Berlin. In this case the vertical upright consists of two halves of a rolled broad flange beam 20 in. in depth and diagonally cut in the web, the one half turned by 180 deg. and then butt welded to the other in the vertical center line, thus forming a tapered column.

Station Roofs Further Developed

This type of railroad station roof was further developed and the result is to be seen in the all-welded station buildings at Duisburg and Düsseldorf. Forked roof supports were placed at 65 ft. distance, their upper ends being connected by articulated girders (see

FIG. 7—Kjellberg building at Finsterwalde in course of erection (Welding Supplies, Ltd., Londor).



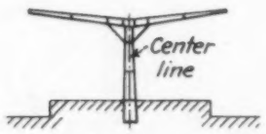
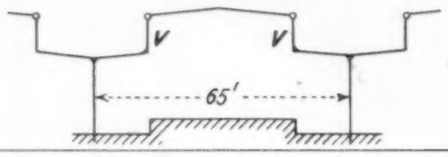
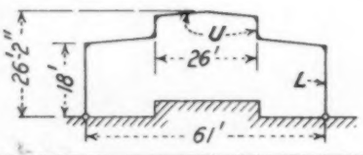
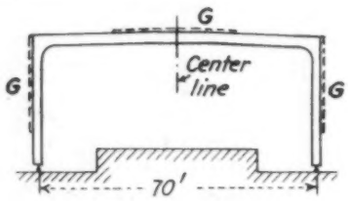
1		Berlin-Schoeneberg 1933	Uprights 20"x12" I B.F.B., Cut in web, Butt weld in center line
2		Duisburg 1935	Forked uprights, restrained at bottom; V.... Vierendeel Girders 70' span
3		Berlin-Jannowitzbrücke 1932	L.... 14"x12" I B.F.B., U.... 12"x12" I B.F.B.
4		Berlin-Zoolog. Garten 1936	Two-pin frame; G.... Glass walls and skylights

TABLE I—Cross Sections of Rigid Frame Station Structures.

Table 1). In the vertical walls are the Vierendeel girders of 70-ft. span, as shown in Fig. 3. The rigid connections between the verticals and the chords could not have been made as simply and economically by any other method than welding. In the case of the large Düsseldorf station the general arrangement is similar to that of the Duisburg station.

When reconstructing the whole Duisburg central station an interesting comparison was made regarding the cost of riveted and welded rigid frames of the two-hinge type. The passenger subway was bridged over with a great number of 59-ft. span frames. In the early stages of reconstruction the first part of the subway was spanned by riveted frames of 19.4 tons each. The remainder of the subway was, however, bridged by welded frames of exactly similar dimensions but weighing only 14.3 tons each. Altogether there were 27 riveted and 21 welded frames of exactly similar dimensions.

Savings in Both Weight and Cost

It is not often that such a favorable opportunity arises for definite numerical comparison. It was found that the 26.3 per cent saving in weight was accompanied by nearly the same saving in cost and that, in addition, the welded frame had a distinctly better appearance than the riveted frame. If an undertaking of the size of the German State Railways turns more and more to welding and away from riveting it appears that the question of the economic superiority of welding has been definitely settled.

Fig. 4 is an interior view of a structural workshop at Duisburg where a number of rigid frame parts are being fabricated by welding. They belong to a station roof of 69-ft. span, the rigid frames being placed at 50-ft. distance. The close-up view, Fig. 5, shows the rounded corner joint between the column and the beam, the latter having a depth of 4 ft. 3 in. in the center.

The rigid frame type used for the Jannowitz station in Berlin has also been indicated in the accompanying table. All members are rolled steel joists, the lower portion consisting of 14 in. deep joists, the upper portion of broad flange beams 12 x 12 in. It is at least doubtful whether rigid frames of this special type prove economical but there are many cases where even a higher price may be justified by the better appearance of a public building of this sort.

One of the most recent station buildings, erected in Berlin in 1936, is shown in Fig. 6. The two-hinged

(CONTINUED ON PAGE 89)

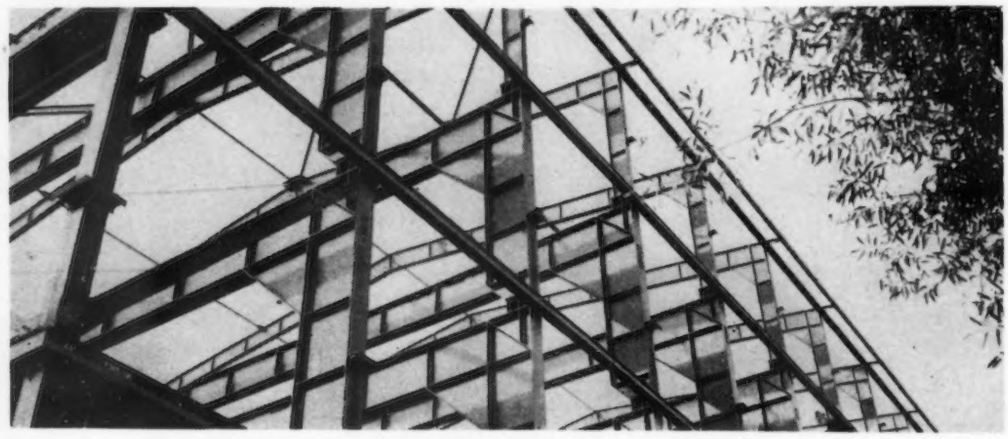


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FIG. 8—Multiple-story frames of the Kjellberg building at Finsterwalde.

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Correlating Engineering and Economic Factors in Belt Selection

o o o

By FRANCIS JURASCHEK
Consulting Editor, The Iron Age

o o o

CHAPTER 32 in a Series on the Economics of Power Transmission Methods and Equipment.

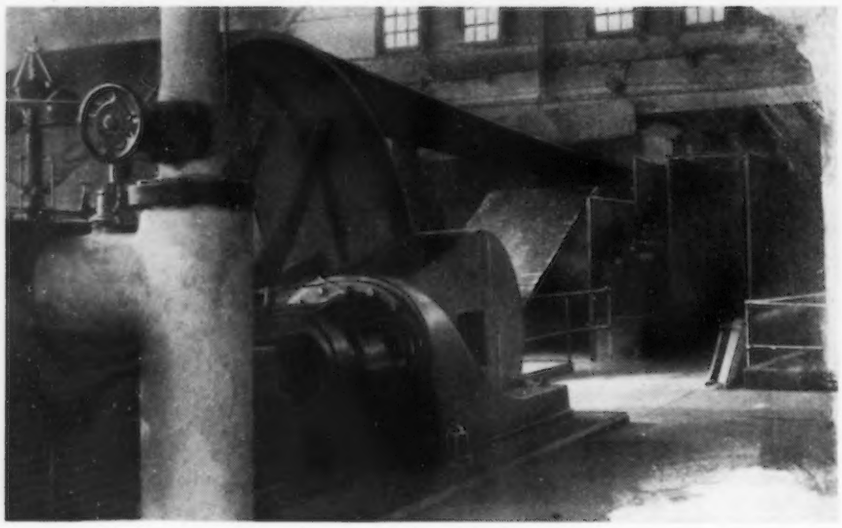
o o o

THE transmission of power by belting has been such an important factor in the design and operation of industrial plants the world over that probably no other item of mechanical equipment has been subjected to more thorough theoretical analysis than the belt. Numerous rules have been formulated for belting design and application; some as "rule of thumb" methods, and others rather startlingly precise in view of the number of variables which must be considered, and of the necessary lack of uniformity in the materials from which belting must be made. Somewhere in between these two extremes lies a golden mean of wisdom, wherein matters of calculation are founded on the empirical data deduced from years of patient observation, and as far removed from the millwright's guesswork on the one hand as from the theoretical analysis of the laboratory scientist on the other.

Belting handbooks and manufacturers' catalogues contain great masses of tabular information on belting calculations. They are all extremely valuable for the purpose of determining the correct type and size of belt to be selected to transmit a given horsepower under specified conditions *at the moment of installation.* Not one table is available, however, that will really help the belt user to select the most economical belt to transmit a given horsepower under specified conditions *over a maximum period of useful life.* Possibly no such table can be constructed. I do not know. But that is the sort of information I should look for if I were a plant man in charge of transmission equipment installation and maintenance.

Haven and Swett, in their "Treatise on Leather Belting" (1931) list a large number of factors to be considered in preparing recommendations for a belt drive. Among the most important are: horsepower to be transmitted, fluctuations of power requirements, sizes of both pulleys, center distance of pulleys, speed of pulleys, inclination of drive, location of slack side of belt, whether belt is open or crossed, and any unusual operating conditions, such as acid fumes, grit or dust in the air, high temperatures, dampness, or angular drive. Nowhere in this list does there seem to be any mention of the consideration of means to insure proper belt tension, or of the influence of various types of pulleys on the belt performance. But these are minor criticisms alongside of the most serious lack in this or any other similar tabulation of the factors entering into belting selection; the factor of length of useful life of the belt. The point of this whole argument is simple: The engineering data available in such quantity for the calculation of a *belting application* is necessary and, for the most part, good; but it is not sufficient for the determination of the whole story of *belting use.*

I have seen one belt, correctly proportioned for a job, and costing X dollars, last three months; and another belt equally correctly proportioned, and costing 2X dollars, replace the first and, under exactly the



ONE of five similar 72 in. wide 3-ply leather belts furnished by Chicago Belting Co. to a cement plant, each of which ran 24 years, 24 hours every day, before being replaced by similar belts.

same conditions of use, last three years. I have seen power transmission cost records on heavy compressor drives range from an average of about $2.00 per horsepower per year to more than $20.00 per horsepower per year. It is very plain that more than the usual engineering calculations should be made in the selection of belting for any given job.

Properties of the Ideal Belt

There is, of course, no such thing as an ideal belt available for any given application. But a consideration of the properties of an ideal belt will help us to compare what is available with what is desired for the job.

The first requirement is ample strength. There should be no fear that a weakness in the belt structure will cause a breakdown and hence a costly stoppage of production. Strength presupposes substance and weight. Against this, contrast the second requirement:

An ideal belt should weigh nothing! Every ounce of weight the drive must carry costs money in power consumed, and adds to the power-wasting effect of centrifugal tension. But there must be a compromise here in order to meet the first requirement of ample strength. Hence, so far we might conclude that the ideal is that belt which weighs the least and yet has the necessary strength to meet the conditions of the job. But three other requirements are essential in addition.

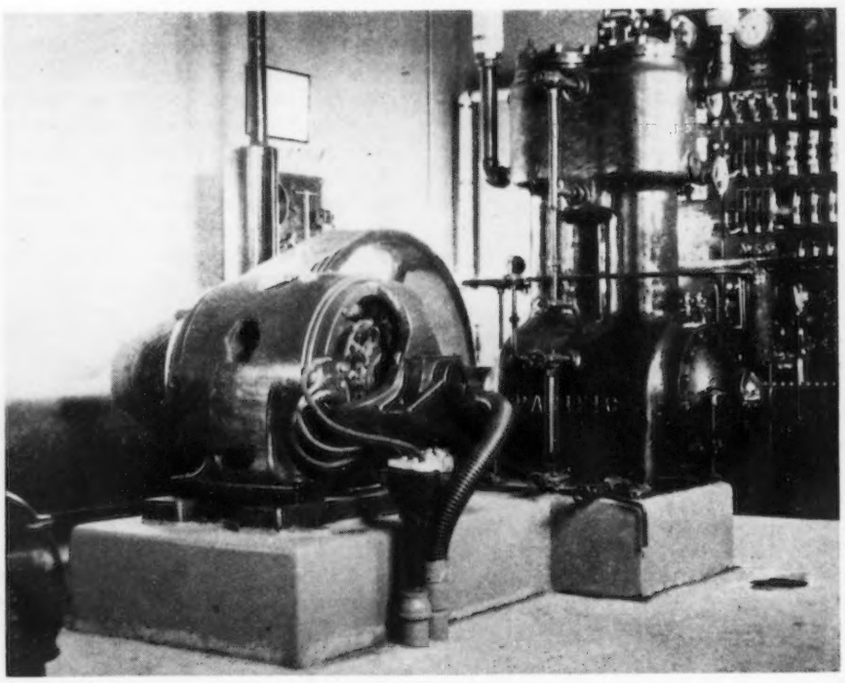
The third requirement is grip. A high coefficient of friction, not only when the belt is new, but during its entire useful life, is most necessary; for the better the grip, other things being equal, the less will be the tension required to maintain effective pulling power.

Tied in with this is the fourth requirement: An ideal belt should be elastic, but should not stretch unduly. An elastic belt may be deformed temporarily by the application of a heavy load; when the load is removed the belt regains its original length with structure unimpaired. Stretch, however, is a permanent deformation caused by elongation beyond the elastic limit. Excessive stretch impairs the belt structure and causes slip. There should be a fair balance between grip and slip in the ideal belt. A belt that stretches continually must be run at high tension, which both wastes power and causes more stretch.

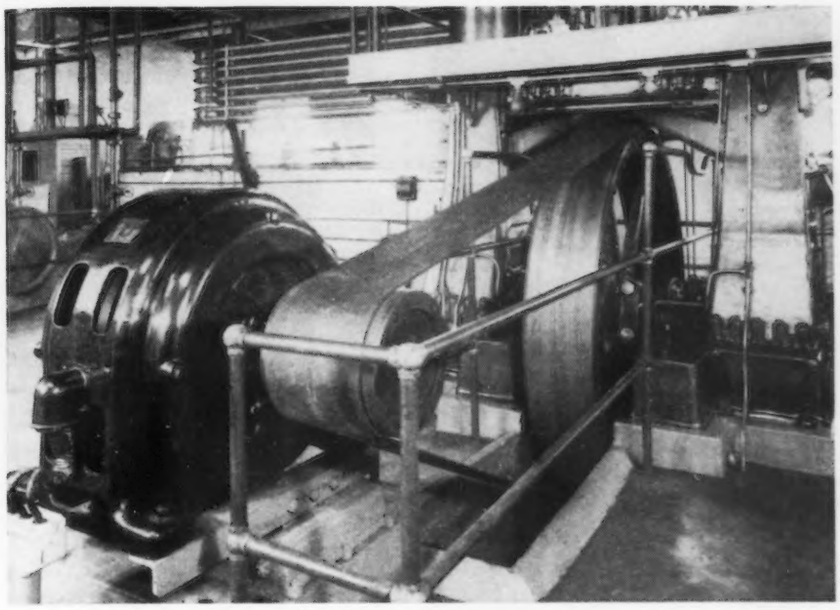
Finally, the ideal belt should have long life combined with the four other properties listed above to insure a minimum cost of power transmitted per unit of time. With ample strength and not too much weight, with enduring grip, reasonable elasticity and not too much stretch, a belt which has a long life of effective usefulness will prove to be an economical power transmission investment.

Efficiency Plus Economy

Fundamentally there is no difference between efficiency and economy; for that which is highly efficient is highly economical, and that which is economical must be efficient, *when the time period in either case is long.* Unfortunately, however, in a great many industrial power transmission problems, the use of these terms is usually based on too short a time period to be of any real value. A test is made of the efficiency of a drive; the input power is measured and compared with a measurement of the output power. The resulting ratio is a measure of efficiency of the drive *at*



A WAGNER 40 hp. slip-ring motor connected to a large air compressor by means of an 8-strand V-belt. Although the center distance is short, the shock is well cushioned.



A VERY high reduction ratio on short centers made possible by the use of a Rockwood base for the 100 hp. motor and a J. E. Rhoads & Sons Tannate leather belt; saving 4 cents per ton of ice manufactured.

the moment of test only. In six months or three years the ratio may be quite different. What, then, is the real efficiency of the drive, and hence the economy? On the other hand, economy is likewise considered too frequently from the monetary standpoint. Here is a drive that cost a certain sum of money installed many years ago. It must be replaced now. Another drive is offered capable of yielding the same efficiency on test, at a great deal less money. It would seem to be a matter of economy to install the second type of drive. Is it? The problem is not to be solved on the basis of the data presented, for the most important element has been left out—time.

No problem in economic values can omit the element of time. I may pay $6.00 for one pair of shoes and $12.00 for another. Only time will tell me which of the two is the more economical purchase. The same condition holds true with respect to the purchase of mechanical equipment of any form. But time alone will not tell the *whole* story; for either one of the pairs of shoes may last longer than the other because of the additional wear I give the one pair, and one piece of mechanical equipment may give a great deal more useful service than another. And, finally, both pairs of shoes, or both pieces of equipment may give excellent service at the beginning; then the efficiency of one pair of shoes or of one piece of equipment may drop off rapidly, so that neither gives the same degree of service as at first.

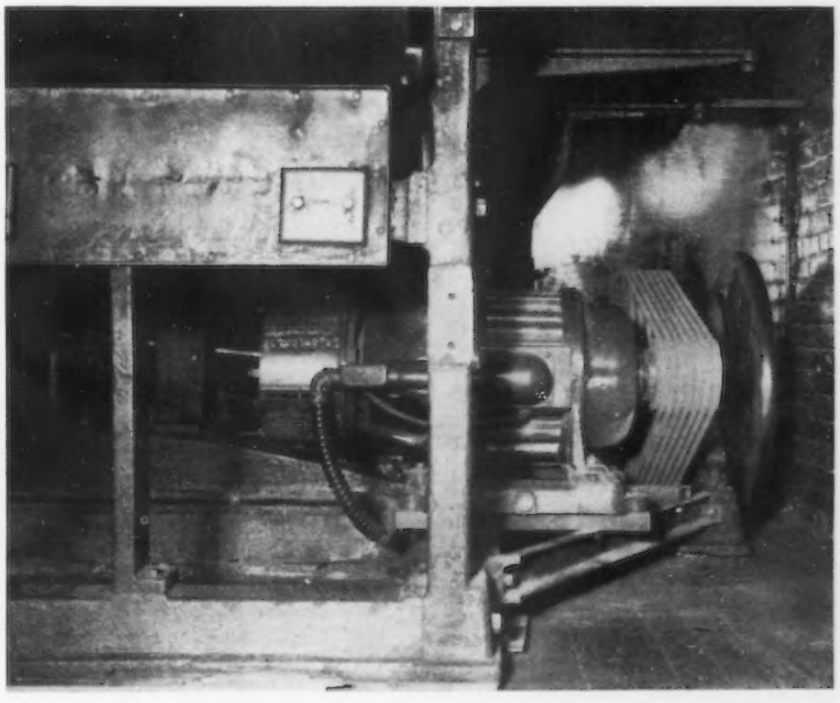
Thus the economic factors to be considered are basically two in number: 1—the life of the equipment, and 2—the efficiency of the service given during that life period. And the engineering factors involved in designing a drive to fit a given set of operating conditions are not enough unless these economic factors are weighed in the balance at the same time.

Correlation

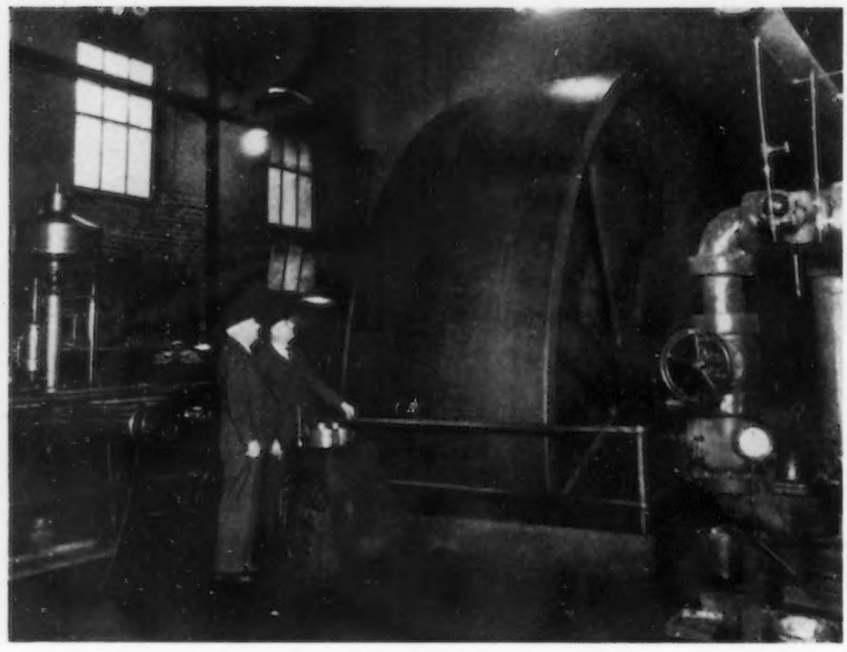
Three factors influence the engineering calculations involved in the design and application of a belt drive: *mechanical* considerations of load, speed, reduction ratio, pulley size, pulley centers, inclination of drive, etc.; *physical* considerations of belting qualities such as strength, weight, coefficient of friction, elasticity, stretch, etc.; and *chemical* considerations of the service reactions on the belt, such as the effect of heat, moisture, oil, acids and alkalies. These factors are commonly included in the calculations for determining the selection of the correct type and size of belt at the moment of application.

Unless, however, the two factors of primary economic importance are considered at the same time, the engineering calculations are largely meaningless. Since these two economic factors are the effective life of the belt, and its efficiency throughout that life, they cannot be considered separately; but must be correlated to the engineering factors and analyzed at the same time.

The difficulties are great, but not insuperable. All engineering calculations are based on the supposition that if a certain size, weight and shape



7 STRANDS of V-belt connect this G. E. 7½ hp. motor with disk-brake to the drive shaft of a Cottrell drum-cylinder paper cutting and creasing press, to give smooth and efficient operation.



THIS 73 in. wide leather belt, 239 ft. long, made by Chicago Belting Co., transmits 2,000 hp. on a sawmill main drive. It has travelled over a 5-pulley drive at one mile a minute for over five years.

of material reacts in a certain way to a given set of service conditions, another piece of similar material of identical size, weight and shape, manufactured under like conditions, will react in the same way. Now, the factors of economy may be assumed in exactly the same manner, on the same bases. Since the data on which engineering calculations are based were obtained from tests of previously used materials, the data on which economic calculations are based may likewise be obtained from tests on previously used materials. The principal difference lies in the fact that the results of the engineering calculations may be tested on the newly designed drive at any moment after it is installed, while the results of the economic calculations can only be tested over the period of the effective life of the installation. Hence, for our knowledge of economic values we must rely entirely on the records of service of similar materials used under similar conditions.

The process of correlating engineering and economic factors in the selection of belting requires, therefore, in addition to the usual design data to be found in hundreds of belting handbooks, the study of records of service of similar belting used under conditions comparable to the job for which the drive is being designed. In the great majority of cases the most practical unit of comparison is the cost of the horsepower transmitted per year over the effective life of the belt.

This unit is usable as a means of comparison of the economic values of two or more belts because it covers the three points included in the question of economy: A—the cost of the belt as installed; B—the efficiency of the belt throughout its effective life (or the ratio of power delivered to power supplied); and C—the cost of maintenance, not only of the belt itself, but of all the members of the drive, to insure the transmission of the necessary amounts of power required by the driven machine.

For instance, a certain leather belt installed on a 500-hp. motor-to-compressor drive in 1917 actually delivered an average of 425 hp. at the compressor until late last year (1937), when it broke. It was then replaced by a new belt, but the original one was still good enough to cut up to make several belts for lighter drives. Neglecting the salvage value in this case, look at the operating record, in round figures for the sake of simplicity:

The average efficiency of the motor and the drive, as tested at various intervals, was 85 per cent. The average motor efficiency alone was 87 per cent. The input to the drive was therefore an average of 435 hp. The drive efficiency, consequently, must be taken as 425 divided by 435, or better than 97½ per cent. The wastage of power caused by this particular degree of efficiency of the drive may now be calculated. Figuring 20 years of operation at 300 days of 8 hours each per year, the total drive input was 20,880,000 hp.-hrs., and the total drive output, 20,400,000 hp.-hrs. 480,000 hp.-hrs. of energy lost in the drive, at a cost of 2.5 cents per horsepower-hour at the motor, makes the cost of power lost in the transmission equipment amount to $12,000 total, or $600 per year. The original cost of the belt drive was $700 as installed, and drive maintenance during 20 years amounted to $1,300 (repairs, adjustments, lubrication, belt dressing, time charges, etc.). Together, these two items amounted to $2,000 over 20 years, or $100 per year. Now, taking our three items of economic value together we see

A—Original cost as installed....	$700
B—Costs due to efficiency losses in drive	12,000
C—Maintenance costs over 20 years	1,300
Total operating cost during life..	$14,000*
Cost per year of operation.....	$700†

*20 times original cost. † Or actual original cost.

Divide this last figure ($700) by the output horsepower, or 425, and it will be seen that the cost per horsepower per year is slightly less than $1.65.

Often item B above is not included in the calculation because of the argument that all belting drives during their effective life are approximately equally efficient. If this were so (which it is not), we would have in the above example the absurd figure of $2,000 as the total operating cost for a 20-year period, or $100 per year; which comes to a trifle over 25 cents per hp. per yr. Such figuring vitiates any just economic comparison not only between one belt and another belt, but between any one form of power transmission equipment and another.

This may be seen clearly in the case of another belt, costing the same as the first and, for the sake of argument, with like maintenance costs over a 20-year period, but which after a couple of years of operation began to slip more than the first belt. This condition would, of course, normally increase maintenance costs (due to more frequent adjustment, dressing, bearing lubrication, etc.), but let us neglect that for the time being and concentrate on the efficiency argument. Because of the increased slippage, the power actually delivered to

the compressor ranged from a high value of 428 hp. to a low of 400. Assume that the average was 410 hp. during the entire 20-year period. Then, with an input of 20,880,000 hp.-hrs. the output would have been only 19,680,000 hp.-hrs. The difference of 1,200,000 hp.-hrs. at 2.5 cents would amount to $30,000 as the cost of the transmission losses in the drive. This figure, divided by 420, the average output, comes to $2.19 per hp. per year, alone. And to this it will always be necessary to add some increased maintenance cost, due to the higher degree of slippage; while this same increased slippage always means greater belt wear, so that the effective life of the belt may actually be a great deal less than the first belt considered.

Summary

It is true that the application of the factors of economy as listed above must be made in a spirit of faith. But the faith necessary to apply them, as based on data secured from the records of similar belts operating under comparable service conditions, does not seem to me to be any greater than the faith required in the application of the usual engineering data to the design of any belting drive.

It is true that dependable records of belt operating costs are few and far between. That, however, is the fault of the belting user rather more than of the belting manufacturer. It is to the interests of both that such records should be kept, but it is the user who must keep them, just as it is the user who can make the best use of them. No purchaser of, let us say, a machine tool, would think of buying a new piece of equipment except on the basis of the demonstrated abilities of that equipment to do a job at a saving of costs over a period of time. And in that saving, first cost, efficiency of operation, and maintenance must all be considered.

Power transmission is no different, basically. The cost of power actually transmitted requires not only a consideration of the cost of the equipment as installed and of the ability of the equipment to transmit the power needed by the driven machine, dependably, but also the cost of the power losses in the transmission equipment, of the cost of maintaining the equipment in a condition that will permit it to transmit the power needed, dependably, but also the cost of the power equipment.

When economics are correlated to engineering, the problems of belt selection become, not simple (for they are never that), but capable of being soundly and intelligently solved. Without such correlation, those problems are highly impractical exercises in abstract mathematics.

NEMA Issues Revised Motor Standards

NEMA Motor and Generator Standards, publication No. 38-49, has been released by the National Electrical Manufacturers Association, 155 East 44th Street, New York. This publication supersedes No. 34-22, published in 1934 under the same title, and the information in the previous edition has been somewhat modified and augmented.

Some of the new material is temperature ratings of various types of enclosed motors, standardized lettering for flange mounted motors and method of measuring motor vibration. The section dealing with adjustable-speed d.c. motors has been revised to give the horsepower ratings for continuous, 1 hr. and tapered duty. A new standard is a table of maximum speeds by field weakening for constant speed d.c. motors having standard horsepower and speed ratings. Copies are available at $2 each.

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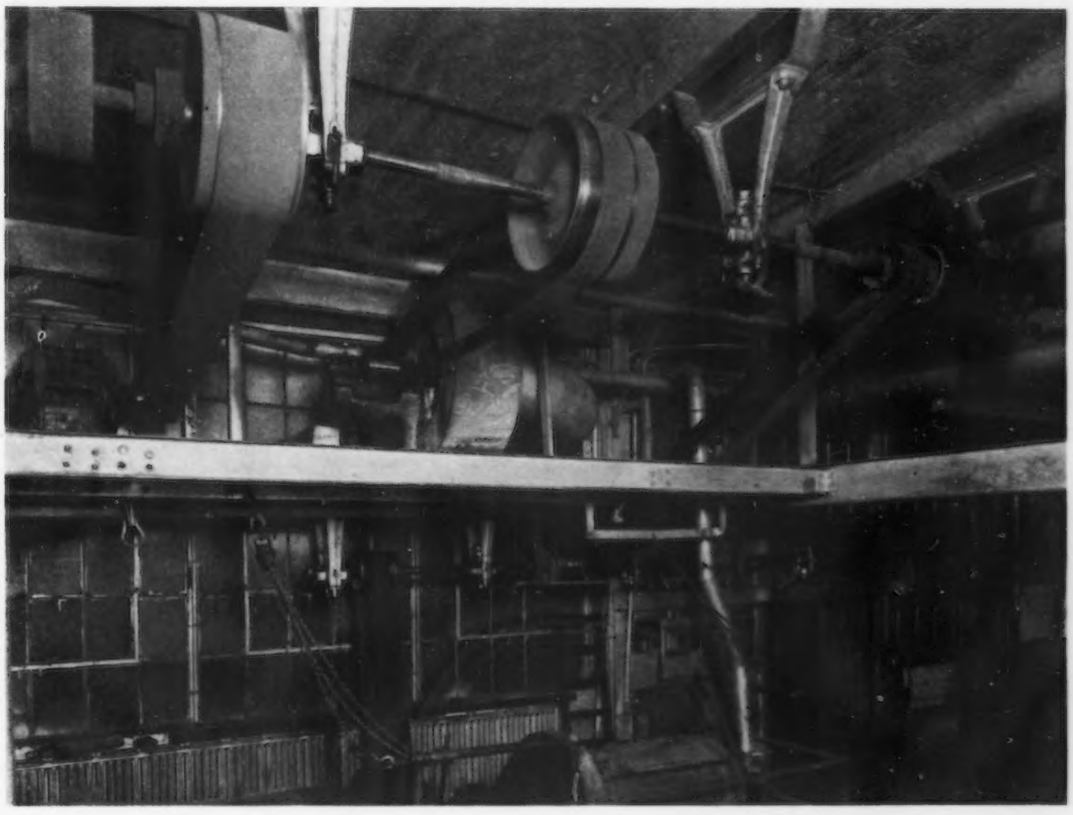

FLAT belts are ideal for driving a miscellaneous group of machines from one motor. Power and transmission costs were cut two-thirds in this shop when group-drive replaced individual motor drive.

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New Developments in Heat

A NUMBER of new and improved types of recording and controlling instruments have been introduced in recent months to make more fully automatic the operation of heat treating furnaces and other process work. Several new types of timers have been announced. New furnaces are described, including one fired by an automatic coal stoker and a forging furnace with automatic temperature controls.

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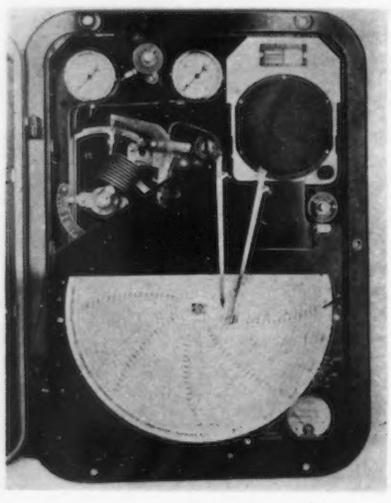
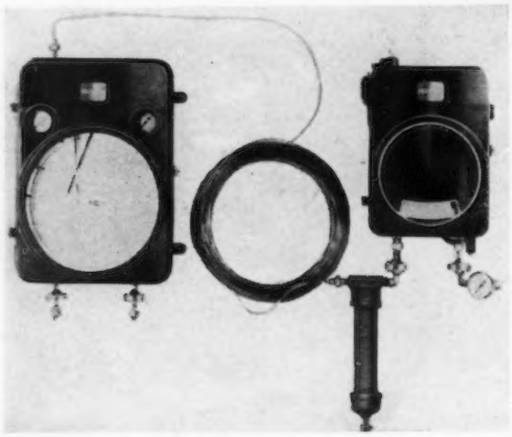
SEVERAL modifications of its controlling instruments and two new methods of remote control have been introduced by the *Bristol Co.*, Waterbury, Conn., in recent months. The free vane principal of pneumatic control in which the measuring element is not restrained by the point control mechanism is being applied in two new instruments. One is a controller with wide throttling range and automatic reset for the control of temperature, pressure, vacuum, flow and liquid level. Any load change, accompanied by a movement of the recording pen away from the control point produces a change in the controlled air pressure of sufficient value to bring the variable back to the control point. The reset mechanism is designed to make this change automatically at a selected rate corresponding to the requirements of the process. The second instrument is an automatic reset potentiometer controller for continuous processes. It will control temperatures up to 3000 deg. F. and is offered as a pyrometer and also as a resistance thermometer. A record of the controlled temperature is made on a 12-in. circular chart.

Bristol's Metavane system is a pneumatic telemetering system for recording and automatically controlling temperature, flow, pressure and liquid level by remote control. It consists of two instruments, a transmitter and a receiver. The former measures the variable, indicates its value on a scale for the operator and transmits the reading to the receiver, which may be several hundred feet away. The two instruments are connected by copper tubing and 15-lb. air pressure transmits the readings. The system is particularly well suited where explosive fumes are present since there are no electrical connections.





ABOVE

RECEIVER (left) and transmitter (right) of the Bristol pneumatic telemetering system for controlling and recording at a distance.

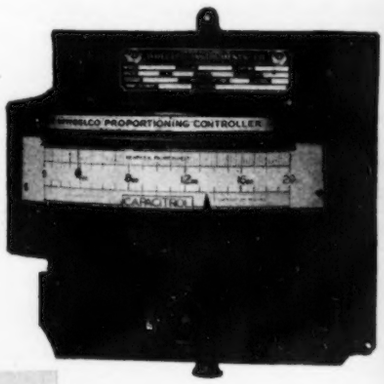
o o o

AT LEFT

THE Bristol Pyromaster reset potentiometer controller incorporates the free-vane operating principle and is intended for controlling temperatures up to 3000 deg. F. for continuous processes.

Proportioning Control

WHERE continuously variable fuel input is required to maintain constant temperature in fuel fired or electrically heated ovens or furnaces, *Wheelco Instruments Co.*, 1929 S. Halsted Street, Chicago, is offering its proportioning control. The operating function is entirely electrical in conjunction with simple valves or contacting equipment. The effect of a continuous input variation is achieved by varying the ratio of "On" time to "Off" time in a time cycle of predetermined length. At the lower end



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WITH the Wheelco portioning control, fuel input is decreased as the temperature approaches the desired point, thus eliminating overshooting.

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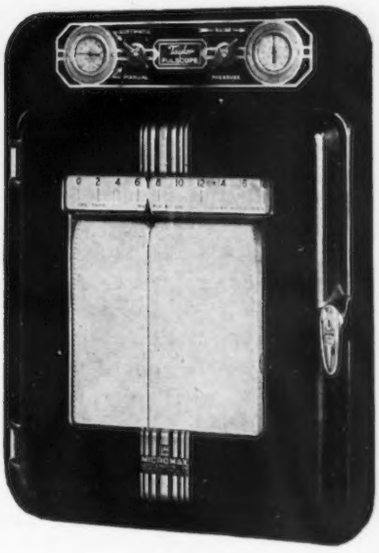
Treating and Process Controls

of the proportioning band on the scale, the "On" time would be 100 per cent; at the upper end, the "Off" time is 100 per cent. At any point within the band, the proportion would vary with the temperature.

Pneumatic Controller with Manual By-Pass

A MANUAL by-pass has been added to the Fulscope Micromax controller introduced last fall by the *Taylor Instrument Cos.*, of Rochester,



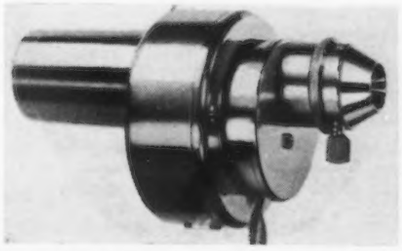
ABOVE

MANUAL by-pass is now standard equipment on Taylor Fulscope Micromax controllers.

N. Y. This by-pass enables ovens to be started up on hand control and cut in on automatic control as the operating temperature is reached. The Fulscope is a pneumatically actuated type instrument, and during manual operation, control point adjustments and compensations for changes in load are made by reducing the air supply pressure and observing the control record. The by-pass also permits adjustments or repairs to the instrument without unduly disturbing the heat balance in the furnace.

Portable Potentiometer

WHEELCO INSTRUMENTS CO., is also offering a new portable potentiometer calibrated in millivolts or in degrees Fahrenheit or Centigrade, or both. It is built in three models: with cold junction compensator; with that and a run-up box; and with these and a standard thermocouple line compensating rheostat. Galvanometer is of the regulation dual taut suspension type, and the instrument is equipped with precision slide wires and multipliers, together with a standard cell.



THE Ardometer shown is the temperature sensitive unit employed in the new Bristol radiation pyrometer, capable of measuring the surface temperature of hot objects above 1000 deg. F. The reading may be recorded on a chart or indicated on a millivoltmeter.

ABOVE

THE Wheelco portable potentiometer is built in three models.

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AT RIGHT

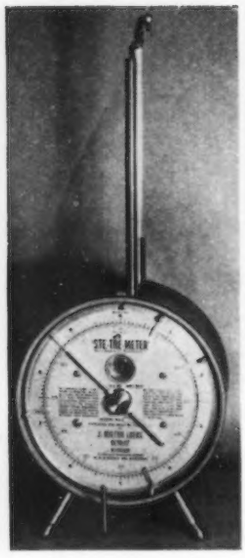
THE G-E dew-point potentiometer is especially useful in measuring moisture content of prepared furnace atmospheres.

Dew-Point Potentiometer

FOR use in determination of moisture content of prepared atmospheres in industrial heat-treating furnaces, the *General Electric Co.* has developed a new portable dew-point potentiometer capable of reading temperatures from 130 to -40 deg. F. Gas to be tested is passed continuously through a chamber in which there is located a metallic mirror which can be seen through a glass. A jet of carbon dioxide or other cooling medium is directed against the back of the mirror, and when a temperature corresponding to the dew-point of the test gas is reached, a spot of dew is readily observable at the center of the mirror. A thermocouple and balancing circuit, with direct reading meter permit the temperature to be read at the instant the dew appears. This reading can then be converted into weight of water vapor per cu. ft.

Timing Devices

AN accurate electric timing clock especially designed for use in the heat treatment of small high speed steel parts and coordinated with movement of the furnace door is



ABOVE

MODEL OA-101-M Cramer interval timer has a 1 min. maximum time scale, with dial divisions in single seconds.

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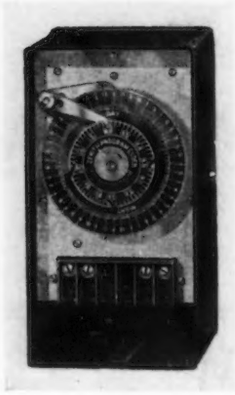
THE Ste-Tre-Meter timing alarm has a pull chain for attachment to the furnace door, to return the time pointer to zero when the door is opened.



ABOVE

TWO pointers with an electrical contact arm ride the large 24-hr. dial and the smaller 1-hr. dial on the Zenith program clock and process timer.

o o o

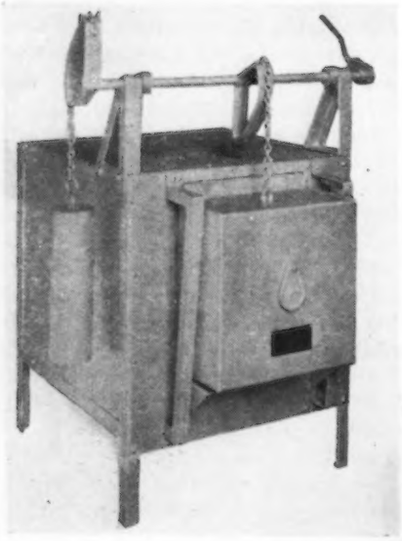
AT LEFT

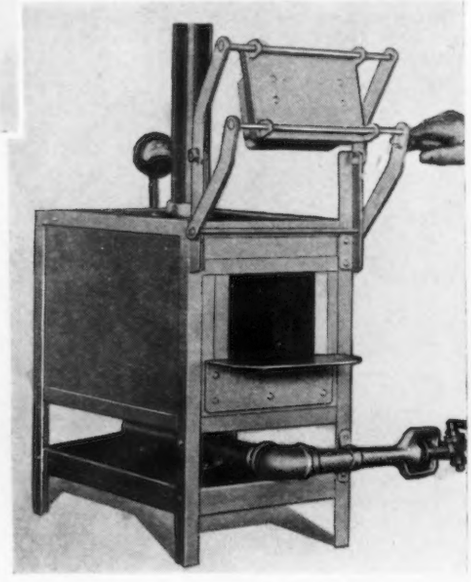
SMALLEST of the type HA Trent furnaces is the No. 4312, rated at 3.5 kw. and with a chamber 4 x 3 in. by 12 in. deep.

o o o

BELOW

THIS tool room furnace, made by Baker & Co., Inc., Newark, N. J., operates on gas and has a temperature range up to 2000 deg. F. without either blower or compressed air. It was erroneously described as having a range up to 1400 deg. in our Feb. 3 issue, p. 51.





being offered by *J. Milton Luers*, 3211 Bellevue Avenue, Detroit. The so-called Ste-Tre-Meter has two time cycles of 10 and 60 min. each, with scale divisions down to 5 sec. Targets are easily adjusted to any time setting, and when the pointer contacts a target, a red light is illuminated and a bell rings. The pointer may be moved at will by hand. There is a foot lever for instantly returning the pointer to zero, and a pull chain and attachment ring allow connections to be made so that opening the furnace door returns the time pointer to zero and holds it.

A WIDE range of timing scales, from 1 min. with 1-sec. dial divisions to 8 hr. with 15-min. dial divisions, is found in the model A interval timers, made by *R. W. Cramer & Co., Inc.*, 67 Irving Place, New York. The quick make-and-break mechanism has silver contacts and normal switch life is said to be 1,000,000 operations at rated load. The timer is driven by a slow speed, self-starting synchronous motor, and is available with normally open, normally closed or double throw contacts. Rated at 10 amp., 120 volts, it will operate motor loads of ½ hp. Automatic stop and delayed start button are optional.

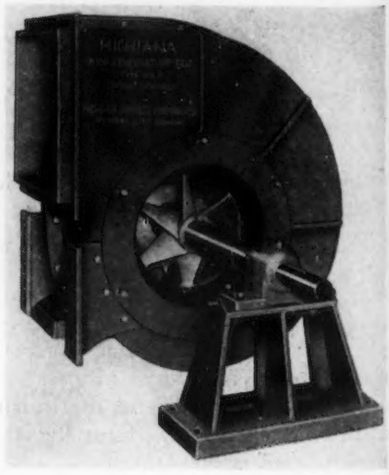
IN the synchronous program clock and process timer made by the *Zenith Electric Co.*, 607 S. Dearborn Street, Chicago, there is one large 24-hr. dial and one 1-hr. dial cam. The latter has slots at each 15-min. period, while segments are cut in the larger dial at the periods the signal is to operate. Pointers engage these slots and ring the signal when both drop. Four types of timer are offered, with either fixed or adjustable signal intervals from 1 to 15 sec.

Heat Treating Furnaces

A NEW high temperature electric furnace operating up to 2470 deg. F., using metallic resistors, heat on four sides and substantial insulation, is being made by the *Harold E. Trent Co.*, 618 N. 54th Street, Philadelphia. These type HA furnaces are made in eight sizes, from 4 x 3 x 12 in. to 18 x 15 x 36 in. The heating elements are of the Trent folded and formed design made of Kanthal. Hydrogen or anhydrous ammonia gas atmosphere is used, led into a refrac-

o o o

MICHIANA Products Corp., Michigan City, Ind., has developed a line of fans for high temperature application, such as the handling of the products of combustion of heat treating furnaces and galvanizing baths. Heat resisting alloys used in their construction permit operation up to 1800 deg. F.



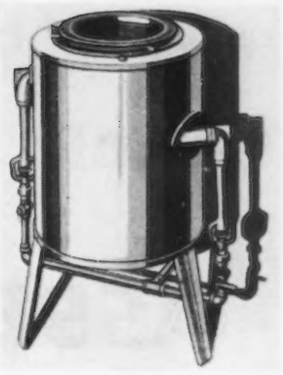
tory box or envelope in which the tools are placed.

The Trent type H box furnaces are of similar design, except that the heating elements are rated at 1850 deg. F. for continuous service. The elements are made of folded and formed strip composed of 80 per cent nickel and 20 per cent chromium. The hearth is of cast nickel chromium. Provision can be made for neutral or slightly decarburizing condition. This type is supplied in 17 sizes.

A LINE of low-priced gas fired pot furnaces that require no auxiliary air is being marketed by the *A. F. Holden Co.*, of New Haven, Conn. The three sizes accommodate pots 8 x 12 in., 10 x 14 in., and 12 x 16 in. in size. The furnaces can be used for temperatures from 300 deg. F. for tempering, up to 1650 deg. for carburizing or any Holden heat treating bath within this range. The furnaces are lined with insulating fire brick. The largest size consumes 300 cu. ft. of gas per hr. and lists at $216. With automatic temperature controls, including thermocouple, it sells for $416.

Oil Strainers

DUOFLO suction oil strainers can be applied to industrial oil burning furnaces, oil processing lines and similar places where oil is used as a fuel or in process. The strainer, made by the *Sheffler-Gross Co., Inc.*, Philadelphia, is a semi-steel casting and has two perforated baskets held in place by the covers. This duplex construction allows one strainer to be cleaned while the other continues in operation. These devices are made in five sizes, 1½, 2, 2½, 3 and 4 in. They are flanged and drilled to American standard specifications and are hydrostatically tested to 150 lb. per sq. in.



ABOVE

THE new Holden gas-fired atmospheric pot furnace operates at temperatures from 300 to 1650 deg. F. and comes in three sizes.

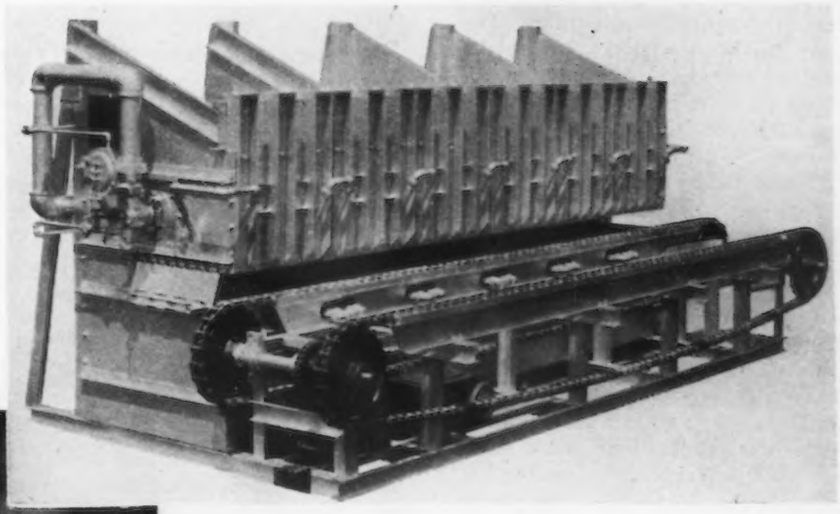
THE F-10 Amsco alloy mushroom valves, made by the American Manganese Steel Division of the American Brake & Shoe Foundry Co., Chicago Heights, Ill., are being used in ingot soaking pits. The alloy contains 26-28 per cent chromium and 10 to 13 per cent nickel and besides resisting oxidation, has considerable strength up to 2100 deg. F. They weigh only 80 lb.

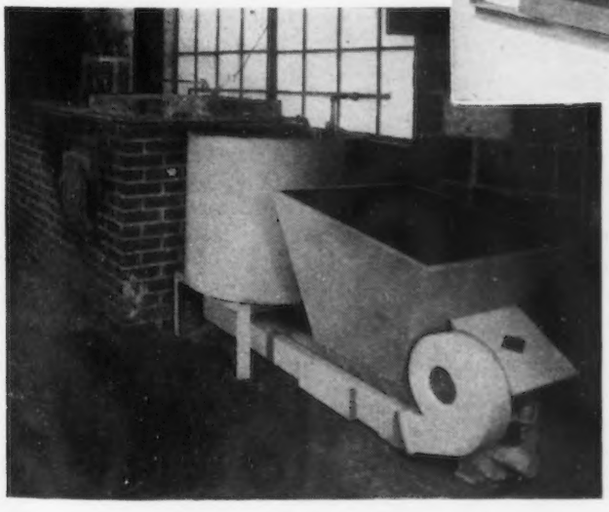
AT RIGHT

THE Duoflo suction oil strainers are made in five sizes and are applicable to industrial oil burning furnaces and oil processing lines.

BELOW

FORGING furnace built by the Surface Combustion Corp., Toledo, for heating seamless steel tubing for the forming of banjo rear axle and differential housings. The furnace is heated by two oil burners located at opposite ends, one burner firing under the work, the other, above it. Temperature is automatically controlled at 2250 deg. F.





AT LEFT

THE Will-Burt Co., Orrville, Ohio, maker of stokers, is using its own product to fire a steel-treating bath, shown alongside the quench baths. Advantages claimed by the company are (1) the cost is but a small part of either gas or oil, (2) the heat can be controlled to exacting requirements, and (3) the backlog of coal fire heat is even and penetrating.

OVER 2,000,000 man-hours without a disabling accident have been achieved by the lamp manufacturing division of Westinghouse Electric & Mfg. Co. at Bloomfield, N. J., where 1000 workmen are employed. This unbroken record on May 1 amounted to 2,189,280 hours during 444 calendar days.

THIS WEEK ON THE ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

. . . Sales advance spurs production to 41,790 units . . . Buick first to buy 1939 steel, places initial order . . . Lincoln-Zephyr influences mold 1939 automobile design . . . Ford declares tractor in experimental stage.

DETROIT.—Revelation a week ago that automobile plants had projected fairly good schedules for the summer months has been followed by indications of better sentiment throughout the industry. Contrary to the normal downward trend in June and July, the industry continues to show improvement in sales, production, and in its will "to get out and do." The change has been felt by suppliers and by the steel industry.

Automobile sales reports for the first 10 days of June indicate a level close to the same period of May, and in one section of the country registrations are more than 11 per cent ahead of those for May. Three large sections of the country have shown a marked pickup over last month, according to R. L. Polk & Co. New passenger car registrations in the Mountain States in June are running 11.3 per cent ahead of May. The Pacific Coast registration and West North Central registrations are up 5.21 and 3.7 per cent on the basis of early returns for June. Other sections of the country are under May.

Assemblies Increase

Production advanced last week to 41,790 cars and trucks, compared with 40,175 for the United States and Canada in the previous week, according to Ward's Automotive Reports. Last year at this time, during the corresponding week, 111,620 units were assembled. It is anticipated that this production level will be maintained for another two or three weeks. The gain of more than 1600 units is attributed principally to Studebaker's improvement from less than 100 to 1400 and other gains at Chevrolet and Chrysler.

Plymouth has announced that production schedules for June and July will be stepped up. K. T. Keller, president of Chrysler Corp., said that this move was prompted by the incerasing acceptance of the Roadking, the lowest priced Plymouth car. After winding up the first quarter of 1938 in first or second place in only 14 major cities, Plymouth has now gained first or second place in 50 market centers in 20 different states, according to May reports.

Truck Sales Strong

Truck activity continues to play a prominent part in the industry's operation. That the field is ripe for further development is indicated by the campaign that Ford, Chevrolet, Dodge, Federal Motors and others are waging through advertising and sales efforts. The introduction of numerous cab-over-engine types almost simultaneously a few weeks ago launched their efforts. Even the little trucks built by Willys are taking part in the surge in truck business, with sales double those for last year. This company recently added a small semi-cab-over-engine panel delivery truck which has helped boost truck sales to the point where they are now approximately 18 per cent of the total Willys deliveries.

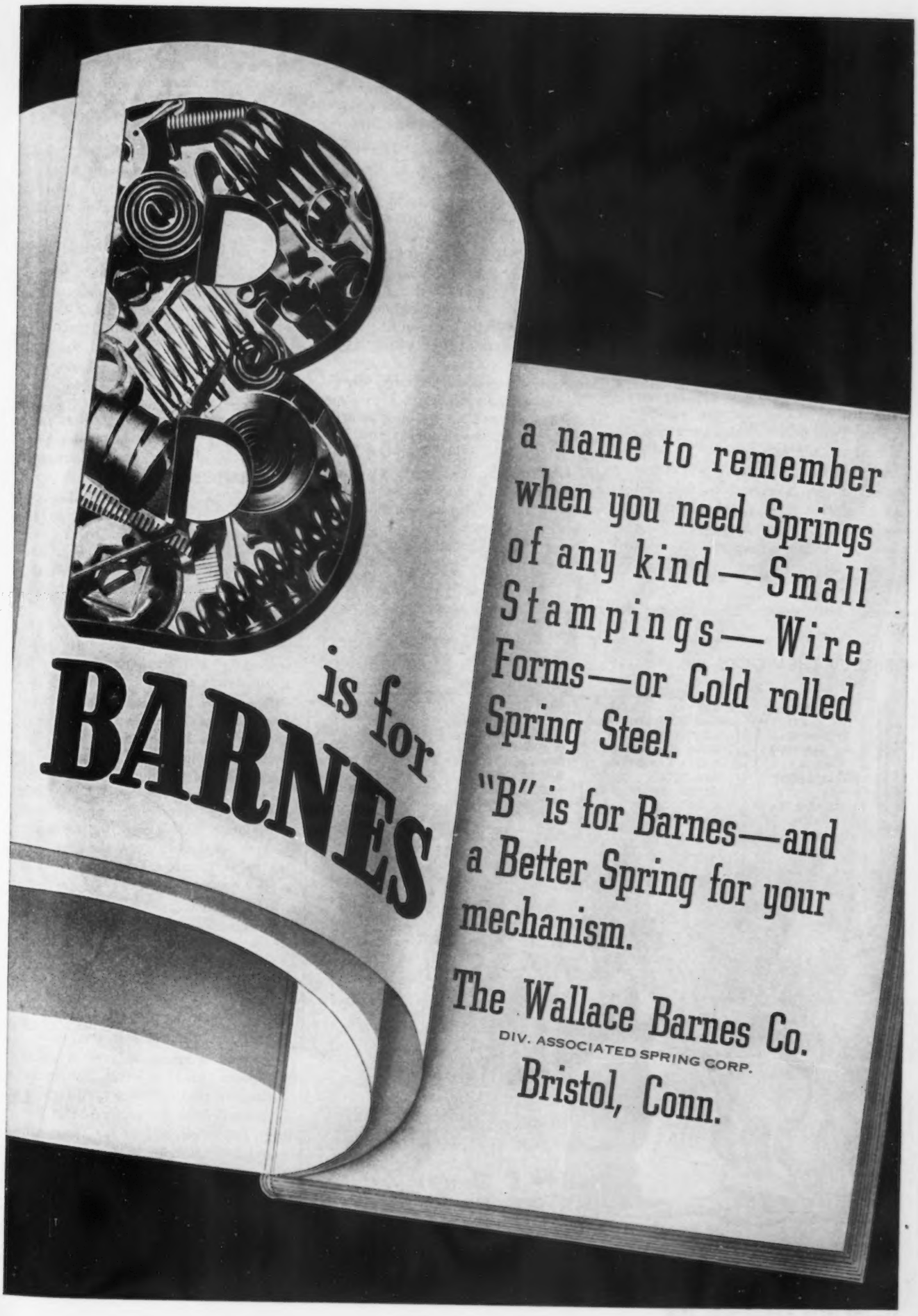
The overseas market continues strong, as indicated by General Motors' most recent report, which showed May sales to dealers totaling 31,566 units, representing a decline of only 5.2 per cent of sales in May last year. In the first five months of this year sales of 161,716 units were at a record volume level and represented an increase of 4.6 per cent over sales in the first five months of 1937. These figures include the products of the corporation's American, Canadian, English and German factories sold outside of the United States and Canada.

As an individual pace-setter, Buick continues to "own the track." Deliveries during the first 10 days of June exceeded those of the first 10 days of May by more than 300. The exact figures being June, 4062, compared with May, 3717. The total June volume should correspond to that for May, it is believed.

Car Financing Gains

Last available figures of the Bureau of Census on automobile financing show an improvement in new car financing for retail and in wholesale operations. During April $49,372,109 was supplied by 456 organizations, it was reported, to finance 78,379 cars, compared with $46,999,250 in March for only 75,712 cars. This goes back to the levels of last December and is far above the February low point of only $34,224,063 for 53,716 cars. Wholesale financing during the same period March-April was stepped up from a little more than $91,000,000 to nearly $96,000,000.

Steel has already felt concrete evidence of the automobile upturn. Unexpected small orders are coming in from many directions and Buick last


B
is for
BARNES
a name to remember when you need Springs of any kind—Small Stampings—Wire Forms—or Cold rolled Spring Steel.
"B" is for Barnes—and a Better Spring for your mechanism.
The Wallace Barnes Co.
DIV. ASSOCIATED SPRING CORP.
Bristol, Conn.

week committed itself for the first 1939 tonnages. Among the clean-up orders that have been placed recently are many like the one from Chevrolet's Bay City plant. Its buying was the first in about seven months and comes now as the result of severely depleted inventory.

It begins to look as if Ford must buy steel in July or begin again to operate its own mills. In the press shop where steel has been piled 15 or 20 ft. high around the presses, with other piles behind these, the working stock has now been eaten up so spectators can easily peer over the front piles and see that the floor behind is clear. When Ford reopens on Aug. 15 after a three-week shut-down, the plant is expected to resume operation on another batch of the current models, with the Ford model change-over coming early in the fall.

After debating several weeks on choice between electrical conduit and less expensive pipe of corresponding specifications, Ford Motor Co. last week bought an estimated 4000 tons of pipe mostly for use in new body plant building which is nearing completion.

In the structural line the latest development is the go-ahead order from General Motors to Albert Kahn, Detroit architect, on the General Motors World's Fair building in New York.

Steel Output Climbs

Movement of presses from the old press floor into the gigantic new building at the Rouge plant has already started on a small scale, with machines being literally "pulled out from under their jobs," it is reported. The new building is by no means complete, but one end of it can be occupied.

Partly in anticipation, partly as a result of the current upward movement, Great Lakes Steel Corp., which is, by the way, an important Ford supplier, has stepped up its open hearth operations 50 per cent and is now operating six furnaces. Another producer, with Detroit offices, says unofficially that "two more weeks of this kind of activity will reopen our mill in Ohio."

Regarding new models the Zephyr influence in 1939 designs will be apparent to even the most casual observer. Not only will Buick have similar lines and "eye-like" treatment of the lower grille and fender skirts in the front, but even the Dodge is reported to be following the same general scheme. While mechanical changes are few in motors and chassis, the stylists have been looking over the fast selling Zephyrs and adapting a few of the ideas incorporated there.

1939 Cars Roomier

Roominess is going to get a play in the advertising for next year's models. In all but the Plymouth line, Chrysler will add something like four inches in a direction that will please stout people.

Striving for greater comfort and smoother riding, Chrysler will go 100 per cent knee-action on the front wheels, but further development of Buick's idea, coil suspension for the rear wheels, is held in abeyance.

Reduction of weight and additional strength will be incorporated in the front end of the Ford, which this year will have a tubular axle. Ford had tried to upset a spring seat on this type axle, but now has settled on welding as the feasible method of attaching plates to support the springs. Ford, by the way, will be the only major selling car with leaf spring suspension at the front end.

It is now conceded that the light Ford car (model 92) will not be forthcoming as a 1939 model. Despite the fact that Henry Ford himself at the celebration of the thirty-fifth anniversary of the company said, "We must have better automobiles and cheaper automobiles." It seemed apparent that he was speaking a generality, not giving an exact answer to queries about a $375 automobile.

The Ford tractor which has caused so much comment, to the mystification of many of Ford's own men, is still in an incomplete stage, Mr. Ford revealed.

"We have one experimental tractor," he said, "which is almost completed. It will soon be in the fields."

If readers remember, the Assembly Line stated on May 5 that "the tractor, despite all that has been written about it, even despite the pictures that have been published, still is far from commercial production. Parts for only three have been made up and it is pretty definite that the original tractor used a regular V-8 engine. Until there are further developments, you can still write it down that Henry Ford still holds all the secrets." That's still true.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

THIS FILE IS SHOT.... IT'S WORN AS SMOOTH AS A GREASED PIG.... IT'S READY TO THROW AWAY
NO--NO--YOU'LL HAVE TO TURN THE OLD ONE IN TO TH' STORE ROOM TO GET A NEW ONE WITH THIS ORDER.... WE'RE KEEPING A RECORD OF 'EM
THEY'RE SURE GITTIN' SAVIN' HERE WHEN THEY GIT TO SAVIN' OLD WORN-OUT FILES.... WHUT CAN THEY SAVE ON A OLD WORN-OUT FILE?
TIME, BOY, TIME -- AND EMERY WHEELS.... I'LL BET THER'S BEEN TWO THOUSAND BREAD, BUTCHER AN' HUNTIN' KNIVES MADE HERE OUT OF OLD FILES ON TH' COMPANY'S TIME, AND FORTY EMERY WHEELS WORN OUT, BEFORE THEY THOUGHT OF IT
J.R.WILLIAMS
COPR. 1938 BY NEA SERVICE, INC.
THE STEAL INDUSTRY
T. M. REG. U. S. PAT. OFF.
6-17

Current Metal Working Activity

Latest Data Assembled by THE IRON AGE from Recognized Sources

	May 1938	April 1938	May 1937	Five Months 1937	Five Months 1938
Steel Ingots: (gross tons)					
Monthly output[a]	1,806,805	1,925,166	5,151,909	24,574,237	9,180,867
Average weekly output[a]	407,857	448,757	1,162,959	1,138,750	.....
Per cent of capacity[a]	30.39	33.44	88.79	84.86	.....
Pig Iron: (gross tons)					
Monthly output[b]	1,255,024	1,376,141	3,537,231	16,599,087	6,811,005
Raw Materials:					
Coke output[c] (net tons)	.....	2,510,964	4,798,511	23,216,313	.....
Lake ore consumed[d] (gross tons)	1,711,146	1,853,658	5,321,011	24,715,312	9,244,627
Castings: (net tons)					
Malleable, orders[e]	.....	19,724	46,018	291,717	.....
Steel, orders[e]	.....	21,869	68,688	540,373	.....
Finished Steel: (net tons)					
Trackwork shipments[a]	2,633	3,793	8,807	54,814	17,036
Fabricated shape orders[f]	.....	92,130	122,939	728,831	.....
Fabricated plate orders[e]	.....	.....	28,913	216,412	.....
U. S. Steel Corp. shipments[g]	465,081	501,972	1,304,039	6,345,724	2,532,297
Fabricated Products:					
Automobile production[i]	211,300*	238,133	540,377	2,396,315	1,102,502*
Construction contracts[j]	$283,156‡	$222,016‡	$244,113‡	$1,176,377‡	$1,046,600‡
Steel furniture shipments[e]	.....	.....	$2,259‡	$11,483‡	.....
Steel boiler orders[e] (sq. ft.)	.....	474,931	1,015,282	4,793,138	.....
Locomotives ordered[k]	5	3	14	206	44
Freight cars ordered[k]	6,114	3	3,903	44,562	6,933
Machine tool index[l]	66.7	90.3	208.5	234.2†	88.0†
Foundry equipment index[m]	90.6	79.3	237.6	248.1†	94.9†
Exports: (gross tons)					
Total iron and steel[r]	.....	489,202	1,043,489	2,790,426	.....
All rolled and finished steel[r]	.....	129,252	443,891	1,632,430	.....
Scrap[r]	.....	306,900	630,671	1,620,114	.....
Imports: (gross tons)					
Total iron and steel[r]	.....	21,237	49,050	253,743	.....
Pig iron[r]	.....	3,823	6,361	52,324	.....
All rolled steel[r]	.....	12,761	29,031	147,273	.....
British Production: (gross tons)					
Pig iron[s]	633,900	661,000	696,300	3,311,700	3,463,900
Steel ingots[s]	957,000	938,000	1,047,300	5,232,800	5,149,800

† Three months' average. ‡ 000 omitted. * Preliminary.
Source of data: [a] American Iron and Steel Institute; [b] THE IRON AGE; [c] Bureau of Mines; [d] Lake Superior Iron Ore Association; [e] Bureau of the Census; [f] American Institute of Steel Construction; [g] United States Steel Corp.; [i] Preliminary figures from Automobile Manufacturers Association—Final figures from Bureau of the Census, U. S. and Canada; [j] F. W. Dodge Corp.—37 Eastern states; [k] *Railway Age*; [l] National Machine Tool Builders Association; [m] Foundry Equipment Manufacturers Association; [r] Department of Commerce; [s] British Iron and Steel Federation.

Weekly Booking of Construction Steel

	Week Ended				Year to Date	
	June 21, 1938	June 14, 1938	May 24, 1938	June 22, 1937	1938	1937
Fabricated structural steel awards	8,800	22,500	12,200	15,325	328,745	585,490
Fabricated plate awards	6,500	660	635	105	68,430	72,485
Steel sheet piling awards	0	0	3,700	3,820	15,825	30,520
Reinforcing bar awards	7,125	5,025	5,325	6,300	107,500	110,685
Total Lettings of Construction Steel	22,425	28,185	21,860	25,550	520,500	799,180

THIS WEEK IN WASHINGTON

. . . Monopoly resolution the most significant legislative action of recent Congress so far as industry is concerned . . . Wage and hour bill, effective next October, will not greatly affect steel and metal-working industries.

By L. W. MOFFETT
Resident Washington Editor
The Iron Age

o o o

WASHINGTON. — For the steel industry the most directly significant thing done by the $13,000,000,000 session of Congress which ended last Thursday night was passage of the so-called monopoly resolution. Inspired by the President in his April message, the resolution sets up a legislative-executive committee of 12 members to conduct a $500,000 investigation looking to tightening up of the anti-trust laws. The inquiry will be aimed particularly at big business, which long has been the target of Administration attack.

Steel often has borne the brunt of criticism, particularly because of what the critics insist are high and rigid prices. Replies to criticism by steel executives either are disregarded or made the object of renewed attack.

Because it has been assailed as an important element in the pricing policy of steel and other basic industries, it is evident that the basing point system will receive serious attention at the hands of the committee with a view to elimination of that system. As early as April, 1937, the President expressed concern over what was called an unbalanced price structure, specifically criticised advances in steel and copper prices, maintaining they were not justified by wage increases.

Other Congressional activities were:

Steel scrap export licensing legislation tabled.

The Senate Civil Liberties Committee was told by Ernest T. Weir, chairman, National Steel Corp., that an anti-industrial movement in this country had become so general that the National Association of Manufacturers had found it necessary to launch a counter public information program. Charles R. Hook, president of the American Rolling Mill Co., and of the NAM, told the committee that the association's aim was to take the mystery out of business.

Tin plate makers appeared before House Committee on Coinage, Weights and Measures in opposition to bill to standardize tin containers. The bill not reported.

Representative Teigan, Farmer-Laborite of Minnesota, introduced a bill to nationalize the iron and steel industry. It was referred to Ways and Means Committee.

The Thomas bill to authorize the Army and Navy to buy and stock $75,000,000 worth of "strategic and critical" materials for emergency use received the approval of all Government departments concerned excepting the Budget Bureau. This opposition was sufficient to kill the bill, a sub-committee of the Senate Military Affairs Committee declining to recommend passage.

Railroad Aid Measure Died

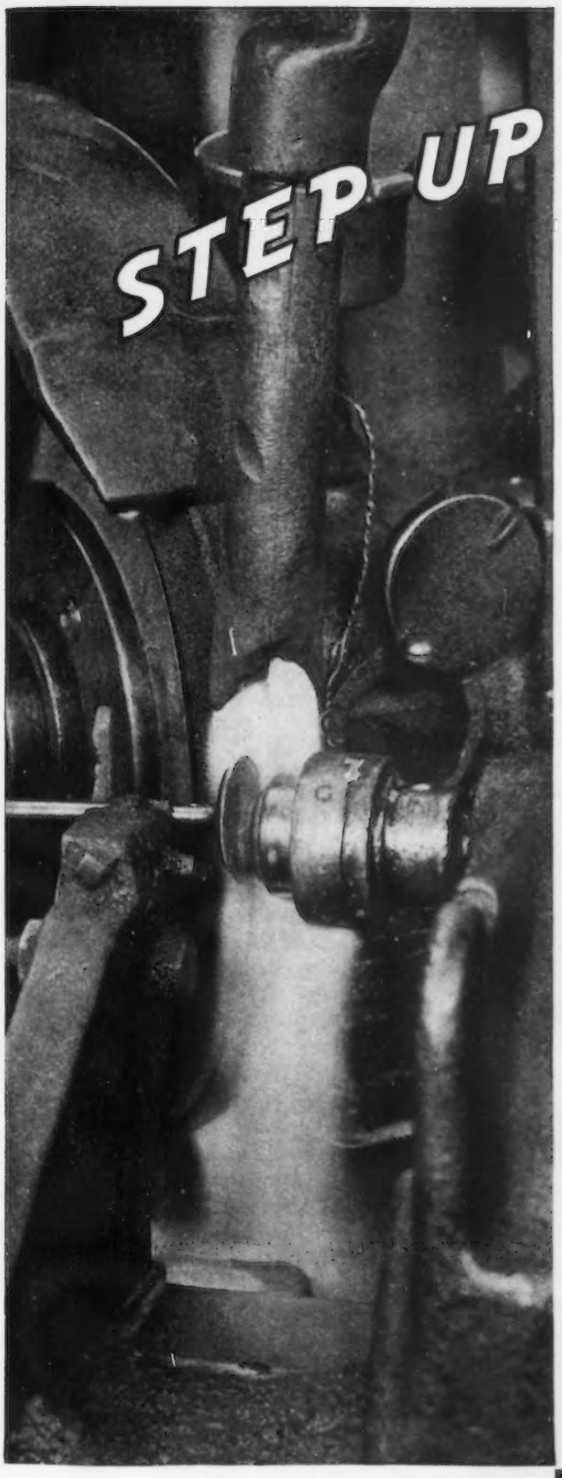
Equipment and work loans for the railroads was the objective of the Wagner - Goldsborough bill which roused the ire of the railroad brotherhoods after they were advised of a contemplated wage cut. Congressional opposition grew, the White House failed to take any affirmative action, railroad management appeared to be divided on the issue, and the measure died in the adjournment rush although there were several eleventh-hour attempts at revival.

Senator Burke, Democrat, of Nebraska, failed in his proposal to investigate activities of the National Labor Relations Board after the Senate Judiciary Committee voted against the move, designed as a forerunner of Wagner Act revision. Administration lieutenants successfully sidetracked similar proposals and revision of the law remained the subject of speculation rather than of any concrete moves in that direction when the session ended. The President's commission to study the British labor relations law has precipitated discussions over the possibility of revision not because there is any substantial evidence that the Administration might be ready to sponsor a correction of the law but because CIO President John L. Lewis opposes the move.

NLRB Recognizes Two John L. Lewis' Unions

WASHINGTON.—The National Labor Relations Board last week recognized two CIO unions in New York and Connecticut and ordered the reinstatement of three employees at the Union Die Casting Co., Los Angeles, Cal., allegedly discharged for membership in the CIO's United Automobile Workers Union. The board ordered dissolution of the Udico Bargaining Union at the Los Angeles plant. The NLRB called this group "company dominated."

The UAWU was recognized as the exclusive collective bargaining group for factory workers at the Marlin-Rockwell Corp., Jamestown, N. Y., and the CIO's Waterbury Brass Workers Union was certified as the bargaining group for workers at the American Brass Co., Waterbury, Conn. Recognition of the unions resulted from elections ordered by the board, the NLRB said.



MACHINE TOOL OUTPUT

...WITH SUNOCO

Increased cost of production can only be offset by increasing the production per unit of equipment.

Close limits of size, rapid removal of metal, decreased down time for tool regrinding and smooth operation of machines are largely dependent on the cutting oil.

Metal cutting plants large and small are finding SUNOCO permits more pieces per tool grind—thus increasing production.

SUNOCO makes possible greater accuracy, better finishes, steps up your production, reduces your down time, decreases your rejects and lowers your operating costs.

SUNOCO

EMULSIFYING

CUTTING OIL

SUN OIL COMPANY, PHILADELPHIA, PA., U. S. A.

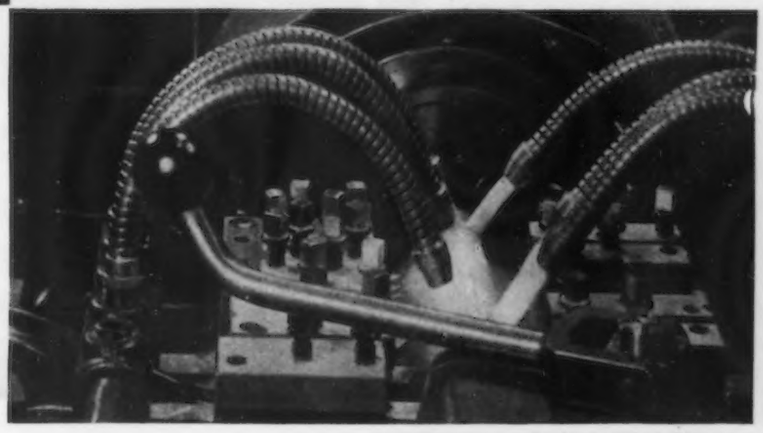
Offices and Warehouses in more than 100 cities

Subsidiary Companies:

Sun Oil Co., Ltd., Montreal, Toronto • British Sun Oil Co., Ltd., London, England

SUNOCO has won widest recognition for:

1. Aiding machines to produce at rated capacity.
2. Precision work, even at higher speeds and feeds.
3. Longer tool life.
4. Better finish.
5. Fewer rejects.



Wage-Hour Bill to Become Effective in October Next

WASHINGTON. — To become effective the latter part of October, the Fair Labor Standards (wage-hour) Act of 1938 was a notable victory for the Administration over strong business opposition. Defeated on two occasions in the course of a rough two-year legislative struggle, the Administration regained the necessary political power to force the measure through Congress shortly before adjournment.

It is not the rigid act that either the Administration or organized labor wanted. It is a compromise. But it sets up principles that both the President and organized labor fought for and business opposed. Organized labor—that is AFL and CIO—itself differed over the terms of the legislation but it was a unit in favoring Government regimentation over minimum wages and maximum hours. Organized labor virtually has served notice that it will ask that the new law be tightened further and it is a common view that the Administration, flushed with success, will go along with organized labor and demand a greater rigidity and perhaps higher minimum wages.

Nor is it the specific terms of the new law that excites a large cross section of business so much as it is the implication of legislation. The outstanding apprehension is that the law marks a long stride toward re-establishment of another NRA. Fear is felt that more stringent wage standards, if not hour standards, will be built into the new law by amendment and that already the forthcoming anti-monopoly investigation looks to Federal control of fair trade practices. Fitted together they would afford back-door reentrance of the old Blue Eagle with its bureaucratic regimentation of all business of the country, despite the utter failure of the earlier NRA experiment.

The new law itself theoretically will not affect such basic industries as steel, metal-working, foundry, etc., whose wage standards far exceed its requirements and whose hour standards either exceed or are well within the terms of the law. Actually, however, all industries are affected inasmuch as their standards, despite their legal qualifications, are subjected to investigation and therefore to Government harassment which many think will further depress the already depressed industrial life of the country. It is obvious that the effect of the new law will depend largely on its administration—whether it is as fairly and as intelligently administered as is possible under its terms. Even when so administered it promises to be disturbing because of upsets that will follow in long-established wage and hour relationships, especially affecting sections of southern industry where wages are below the required minimum of 25c. an hr. and hours exceed the required maximum of 44 per week. It is feared that the effect will go beyond the laudable contention that the act is directed against the sweatshop and child labor.

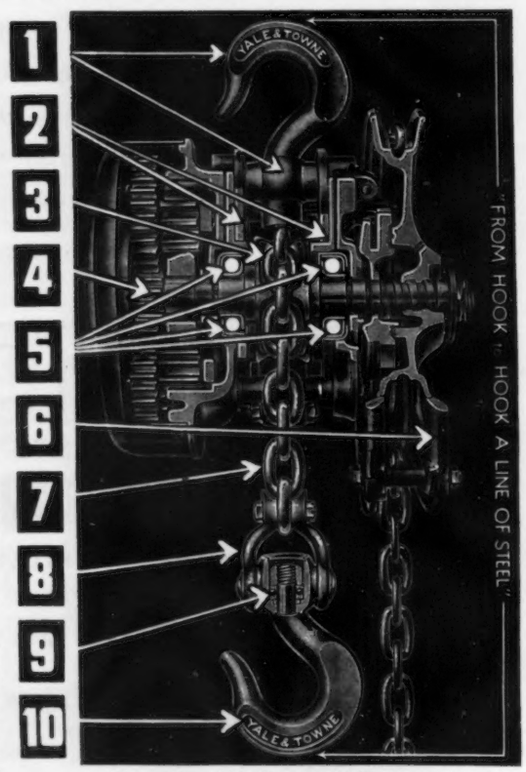
Outstanding provisions of the act are:

It establishes in the Department of Labor a wage and hour division un-

10 REASONS WHY BUYERS SELECT YALE CHAIN HOISTS

Because . . . the SUPREMACY of Yale Ball Bearing Spur-Geared Chain Hoists has never been interrupted. Built by the oldest as well as the largest manufacturer of this type of equipment, Yale Chain Hoists have an international reputation for QUALITY and that quality is based on the outstanding features of construction, as follows:

1 Heavy forged steel safety hook and cross head designed to withstand shock.
2 Heavy wrought steel suspension plates support the load between the top hook cross head and load sheave.
3 The load sheave on which the load is lifted is a massive special analysis steel casting.
4 The driving pinion is a one-piece forging of special steel.
5 Ball bearings upon which the load sheave is mounted are of high carbon chrome alloy steel running in chrome vanadium steel races.
6 A continuous and adjustable hand chain guide which prevents snagging and fouling of hand chain, made of tough malleable iron having a tensile strength of 50,000 pounds.
7 The load chain is of steel, welded and heat treated.
8 Drop forged two-piece shackles with heat-treated suspension pin permit changing or replacing load chain without welding.
9 Lower hook is equipped with heavy duty ball bearing, completely enclosed, packed in grease, requires no further lubrication.
10 Steel safety hook opens slowly without fracture before any other part of the hoist is overstrained—protects operator and load.



Capacities 300 Lbs. to 40 Tons

Note: All Yale Hoists are tested to 50% overload—long ton rating, 2240 lbs.

Yale Chain Hoists and allied equipment are sold only through Yale Distributors—in order to provide American industry with the fastest, most satisfactory kind of service.

TRADE YALE MARK

THE YALE & TOWNE MFG. CO.
PHILADELPHIA DIVISION, PHILADELPHIA, PA., U.S.A.
IN CANADA: ST. CATHARINES, ONT.

der an administrator to be appointed by the President and confirmed by the Senate. The administrator can appoint industry committees for any and all interstate industries or even for units of a single industry, regardless of wages paid.

It establishes a universal minimum wage of 25c. an hr. for the first year, to be increased to 30c. for the following six years and then 40c. However, a rate as high as 40c. may be recommended for immediate application at any time, after investigation by the industry committees, which will be composed equally of employer, employee and Government representatives, one of the latter to act as chairman. The committee may, but is not required to hold hearings. The administrator can reject committee recommendations.

"The committee," says the law, "shall recommend to the administrator the highest minimum wage rates for the industry which it determines, having due regard for economic and competitive conditions, will not substantially curtail employment in the industry."

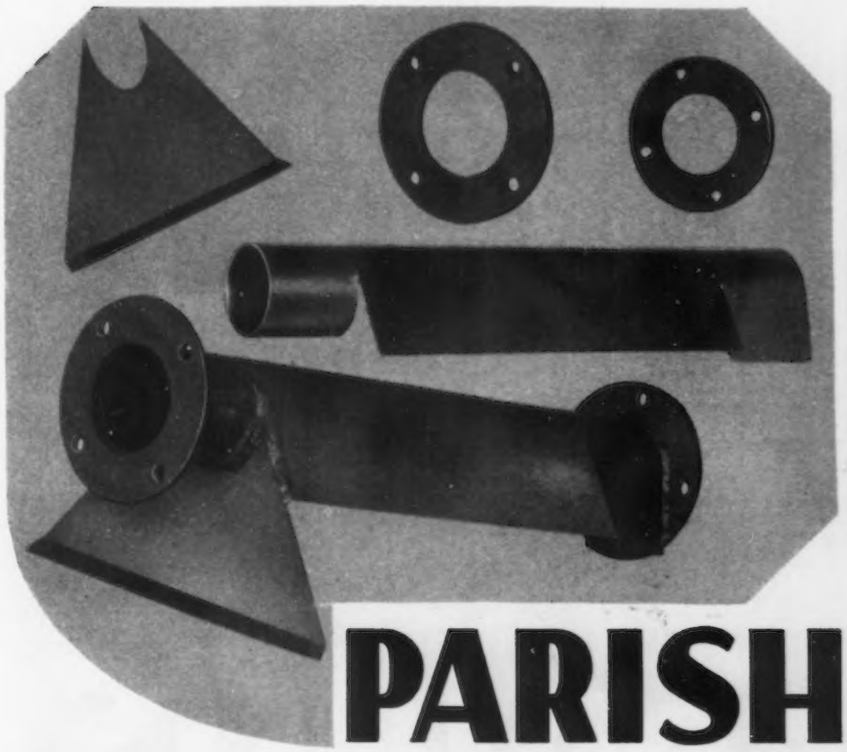
The law itself, not the administrator, fixes the hours. It establishes a maximum 44-hr. week the first year, a 42-hr. week the second year and a 40-hr. week thereafter. Overtime work is permitted if the employee is paid at a rate of not less than time and one-half.

Special provision is made for work weeks in excess of the prescribed maximum if agreed upon through collective bargaining by representatives of employees certified as bona fide by the National Labor Relations Board. Such collective contracts may provide for as much as 2000 hours of work during any 52 consecutive weeks, or in the case of seasonal industries for work-weeks in excess of the maximum for a period of not more than 14 weeks in any calendar year. Time and half pay is required for overtime for work in excess of 12-hr. or for more than 56-hr. in any work-week agreed upon by collective bargaining.

Fixing of geographical differentials is left to industry committees, but no minimum wage rate may be fixed "solely on a regional basis." The committee and the administrator are required to consider competitive conditions as affected by transportation, living and production costs; wages established for work of like or comparable character by collective labor agreements negotiated between employers and employees by representatives of their own choosing; wages paid for work of like or comparable character by employers who voluntarily maintain wage standards.

Upon approval of industry committee recommendations, the administrator will issue an order making the minimum wage rate binding upon the industry or classification affected. If he rejects the recommendations, the administrator is required to refer the subject again to the industry committee or to another committee for further study. The law places no limit on the number of members of each committee, two-thirds of which make a quorum. Decision requires a majority vote.

Review of administrator orders can be obtained in a Federal Circuit Court of Appeals. Petition for a review must be filed within 60 days of issuance of the order. Review by the Court will be limited to questions of law. Findings of fact by the administrator, "when supported by sub-



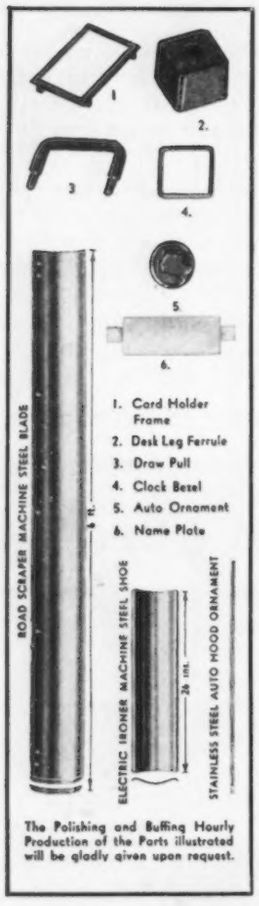
PARISH

for Unusual Stampings

Simple or complicated, straight from the press or built up by additional operations, whatever your needs . . . Parish can be of service. Parish men know metal habits, and how to bend these tough materials to their will—*and yours.*

We ask an opportunity to discuss your requirements with you. A representative will call at any time you suggest.

PARISH PRESSED STEEL CO.
READING, PA.
PACIFIC COAST REPRESENTATIVE, F. Somers Peterson Co., 57 California St., San Francisco, Cal.



The Polishing and Buffing Hourly Production of the Parts illustrated will be gladly given upon request.

Is FINISHING Your Problem?

The parts shown are Automatically Polished and Buffed on Packer Machines—Production increased—Hour Costs reduced. Varied shapes, sizes and metals in volume production, more uniformly Polished and Buffed. Packer Machines pay for themselves in a short time.

Packer Machines are made in three types—Rotary, Straight Line Conveyor and the Vertical Portable type.

Packer engineers have solved many difficult Finishing problems by designing special machines of unusual size and application.

May we help you?

PACKER
Automatic
POLISHING
***and* BUFFING**
MACHINES

THE PACKER MACHINE CO.
MERIDEN, CONN.

SPRINGS
FOR EVERY MECHANICAL NEED
COIL SPRINGS
FLAT SPRINGS
WIRE SPECIALTIES
WIRE FORMS
MANY of the country's foremost manufacturers use American Springs exclusively—having adopted them after the most severe and rigid tests. Similar tests may prove to you that the dependability and uniformity of American Springs would form your strongest assurance against "spring failure" in your products.
SNAP RINGS
LOCK SPRINGS
SPECIAL SPRINGS
from Every Type of Wire up to & including ½ dia.
Send for Quotations
AMERICAN SPRING
AND MANUFACTURING CORPORATION
PARK AVE. HOLLY MICHIGAN

stantial evidence, will be conclusive." The Circuit Court may allow presentation of additional evidence if the court believes it may materially affect the result of the proceedings. The procedure for court review is similar to that provided by the National Labor Relations Act.

Violators of the wage-hour act will be subject to a fine up to $10,000 or to imprisonment up to six months, or both.

The law exempts workers in retail trades, fishing, agriculture and the first processing of farm products, service trades, etc.

The administrator will receive a salary of $10,000 a year. Employees will be appointed subject to civil service laws. Members of industry committees will be paid by the Government on a per diem basis. Attorneys engaged in litigation for the administrator will be subject to the direction of the Attorney General.

Contracts Awarded for Four More Cargo Ships

WASHINGTON.—The Maritime Commission last week awarded contracts to Federal Shipbuilding & Dry Dock Co., of Kearny, N. J., and Sun Shipbuilding & Dry Dock Co., of Chester, Pa., for the construction of four more C-2 steel cargo vessels. Officials estimated 14,400 tons of steel would be required.

The Federal shipyards will build two steam-propelled vessels while the Sun company will construct two diesel-powered ships. This brings to six, the number of steel cargo vessels of these types being built by each of the two companies. By contracting for the four additional ships, the commission took advantage of lower bids based on a six-ship price basis.

Federal bid $1,995,000 each on a fixed price basis for four vessels and $1,967,000 each if six ships were ordered. Sun bid $2,075,000 each for four ships and $2,065,000 each on a six-vessel price basis.

Navy Opens Bids July 5 On 700 Tons of Bars And 1455 Tons of Plates

WASHINGTON.—The Bureau of Supplies and Accounts, Navy Department, will open bids on July 5 for approximately 700 tons of steel bars for stock for various Navy yards.

• • •

WASHINGTON.—The Bureau of Supplies and Accounts, Navy Department, will open bids on July 5 for 1455 tons of plates for the various navy yards.

Whether Price-Cutting Charge Is Slander Up to High Court

WASHNGTON.—Is it slander in itself to charge a merchant with price cutting and selling below cost?

Taking on a social as well as its economic phase, the Supreme Court has been asked to answer this question. The United States District Court for the District of Columbia said that statements making such charges are not actionable without pleading special damages. The United States Court of Appeals reversed the decision of the District Court, holding that "the court should notice the familiar fact that the practice of selling goods below cost has come in recent years to be widely and sharply condemned as harmful." The case is known as Hurlburt, et al. vs. Meyerson. A petition has been filed with the Supreme Court asking for a writ of certiorari to review the decision of the Court of Appeals.

To support its view respecting the change of public opinion, the Court of Appeals referred to legislation enacted during recent years. Mention was made of the National Industrial Recovery Act, a 1937 amendment to Federal anti-trust laws authorizing contracts between buyer and seller to fix minimum resale prices of identified goods, and state fair trade acts.

Challenging this view, the petition maintains that these laws do not indicate any change in public opinion concerning price cutting. Contention is made that the NIRA was the result of "legislative panic" and that the purpose of the state laws is to protect the right of the owner of a trade mark and enforce resale price contracts.

"To accuse one of cutting prices or of selling below cost is not to state that one is guilty of any improper conduct or of conduct which will hold him up to scorn, ridicule or contempt," the petition says. "Price cutting is a common practice, as is also selling below cost. There is no moral or other obloquy involved in selling what is one's own for whatever he chooses."

What Price **SCRAP?**

Capacities—¼-ton to 15 tons per hour . . . Double and Triple Compression.

G-H Hydraulic Balers compress scrap iron and metal into tight, smooth, uniform bales of maximum density . . . at low cost.

Compact bales command higher prices than loose, bulky scrap, save labor in handling, reduce shipping costs and permit storage of larger tonnage in limited space. Every saving a price advantage!

Write for illustrated bulletins.

GALLAND-HENNING MFG. CO.
2750 S. 31st STREET • MILWAUKEE, WIS.

G-H

HYDRAULIC and ELECTRIC BALING-PRESSES and HYDRAULIC PUMPS

Dunbar perpetuates the craftsmanship of Springmaking . . . to give you uninterrupted service now and years from now.

Your springquiries get conscientious attention and capable execution

DUNBAR BROS. CO.
DIVISION OF ASSOCIATED SPRING CORPORATION BRISTOL, CONNECTICUT

. . . THE NEWS IN BRIEF . . .

. . . Automotive industry continues to show contraseasonal gains in sales and production . . . Registrations climb during June in some areas . . . Buick buys first steel for 1939 models—Page 46.

. . . Steel manufacturers, their price explanations disregarded, may bear the brunt of President Roosevelt's $500,000 monopoly investigation, according to L. W. Moffett, Washington observer of The Iron Age—Page 50.

. . . Machine tool sales in near future to be governed largely by needs of Government arsenals and Navy yards—Page 90.

Patents on a process and the apparatus for mass charging of cold metal into open-hearth furnaces has been issued to the Wellman Engineering Co., Cleveland.—**Page 31.**

NEMA issues revised motor standards.—**Page 41.**

Donald R. Richberg, former head of the National Recovery Administration; Louis G. Hines, director of organization for the American Federation of Labor; Bennett Chapple, vice-president of the American Rolling Mill, and John H. Van Deventer, editor of THE IRON AGE, presiding officer, standing on a common platform for prosperity and jobs for everyone, addressed the meeting of the National Industrial Advertisers Association and the Associated Business Papers, Inc., in Detroit last week.—**Page 58.**

Streamlining for appearance, more and better safety features was the subject of an address by W. A. Hart, chief engineer, Colonial Broach Co., before the Works Foreman's Club.—**Page 60.**

American Society of Tool Engineers visit the Wright Aeronautical Corp. plant at Paterson, N. J.—**Page 61.**

Fan manufacturers to meet in Detroit on July 20.—**Page 61.**

Every industry and every company of importance must put its shoulder to the wheel in furthering public relations work, says John W. Hill, American Iron and Steel Institute.—**Page 62.**

"**Steel** of Today and Tomorrow" is a new exhibit just open in the New York Museum of Science and Industry.—**Page 63.**

How new thinking on the subject of industrial lighting has brought about important developments was discussed by numerous authorities at the General Electric Institute, Nela Park, Cleveland.—**Page 64.**

Fabricators proceed cautiously pending new pay agreements; present wage agreements expire July 8.—**Page 65.**

First roller gate dam on the Ohio River dedicated.—**Page 65.**

Labor Board move to dominate city elections seen by Armco. —**Page 65.**

Highest charge for an air express shipment paid to send Bantam roller bearing to Manila. —**Page 66.**

Pittsburgh car loadings off 44 per cent from 1937.—**Page 66.**

Independent steel union scores J. L. Lewis' lobbying.—**Page 66.**

Furnace representatives report slight advances in New England industry.—**Page 66.**

Curtiss propeller division to move from Buffalo to a factory at Clifton, N. J.—**Page 70.**

Columbia Steel Co. opens new office building.—**Page 94.**

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CONVENTIONS

June 27 to July 1—American Society for Testing Materials, Atlantic City, N. J.

Sept. 26 to 30—Association of Iron and Steel Engineers, Cleveland.

Oct. 10 to 14—American Institute of Steel Construction, French Lick Springs, Ind.

Oct. 12 to 15—The Electrochemical Society, Rochester, N. Y.

Oct. 13 to 15—Society of Automotive Engineers, aircraft production meeting, Los Angeles.

BATTERY OF 5 LAKE ERIE HYDRAULIC *Aircraft* PRESSES

speed plane production and assembly

Showing five 660 ton double action Hydraulic Aircraft Presses being installed by one of the world's leading governmental airplane manufacturers. Note the inexpensive wooden die that has formed the pontoon deck standing at right.

Are you faced with the problem of economically producing a variety of parts in limited quantities?—Then take a tip from the aviation industry and "put it up to Lake Erie".

Airplane manufacturing is the "hot" industry today. With increasing backlogs, delivery dates are becoming more difficult to meet. To overcome this situation, one of the world's leading governmental airplane manufacturers is installing five Lake Erie Hydraulic Presses. Leading by over 2 to 1, Lake Erie Hydraulic Aircraft Presses are serving the Who's Who of the aviation industry both in this country and abroad.

They provide immediately increased production due to the speed and accuracy made possible by using dies instead of forming parts slowly by hand. This not only increases production, but the resultant uniformity of parts speeds up assembly.

Absolute control of working pressures and speeds permits the use of inexpensive, quickly made wooden dies.

Lake Erie Hydraulic Presses have universal adaptability for every operation from deep drawing of large parts down to shallow forming of small pieces using rubber pads with rapid change-over of dies.

AN INVITATION TO EXECUTIVES CONCERNED WITH METAL BLANKING, FORMING, DRAWING AND COINING:

To effect unexpected and worthwhile savings in your plant, take advantage of the long experience of Lake Erie Engineers in designing and building hydraulic presses . . . just "put it up to Lake Erie" by writing to—

LAKE ERIE
ENGINEERING CORP.
BUFFALO, N.Y. U.S.A.

Industrial Advertisers Hear Pleas For Cooperation to End Depression

STANDING on the common platform of prosperity and jobs for everyone, speakers representing government, labor and management made pleas for cooperation at the industrial conference of the National Industrial Advertisers Association and the Associated Business Papers, Inc., in Detroit last week.

Addressed by Donald R. Richberg, former head of the National Recovery Administration and New Deal adviser, an audience of nearly 800 industrialists and delegates to the 34th annual convention and exhibition of the Advertising Federation of America heard the speaker representing government declare that today "we need an economic constitution to state clearly those fundamental principles under which a democratic people can maintain a competitive system of private enterprise that will assure prosperity and jobs."

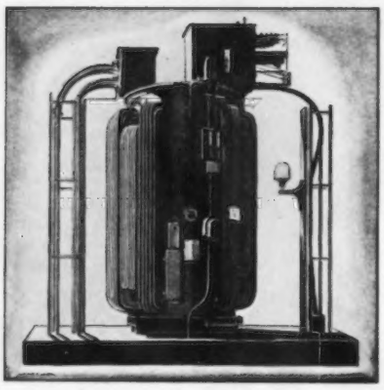
Speaking the same afternoon, Louis G. Hines, director of organization for the American Federation of Labor, restated as an AFL formula that unemployment can only be overcome through creation of work opportunities for working men and women in private industry. "Labor and capital can cooperate," Hines asserted. "Through the development of team work between industry and labor many economic wrongs can be righted, many of the industrial legislative burdens can be remedied and the maximum of service which industry and labor may render can be given the entire nation."

Industry's position and the advertising executive's duty was stated by Bennett Chapple, vice-president of the American Rolling Mill Co., Middletown, Ohio. "This generation is heir to a great economic system," Chapple declared, "and cooperation of the heirs is essential to industrial progress."

Presiding officer at the session was John H. Van Deventer, editor of THE IRON AGE. He declared that merchandisers, manufacturers and the advertising profession face a difficult task in trying to make work for more people by creating the wish and the will to buy. In a time of depression, he said, the most convincing arguments and proofs are nullified by fear. "We must put cooperation to work in America on a grand scale to remove the mountains of fear, doubt and indecision with which we are now confronted," Mr. Van Deventer said. "We must put it to work to create jobs by making business better."

National Purpose Needed

It is necessary to create a national purpose and a national demand that responsible representatives of management, labor and government lay down the weapons of warfare, sit around the council table of peace and do the job, Mr. Richberg told the audience emphatically. There are in all three groups exceedingly active and aggressive war makers who want no peace unless they can dictate the terms, he pointed out, declaring that this aggressive destructive minority is overcoming the good intentions of a passive majority.



Cleaning Power, too, is Adapted

As electric power is "transformed" for your efficient service, cleaning power also is *adapted* to the various conditions and problems encountered in the business of industrial cleaning. The Wyandotte group of Metal Cleaners includes various types of specialized compounds which have been successful in meeting the requirements of metal finishers operating under exacting conditions, during forty years. Each one is sold with a guarantee of satisfaction after a fair trial—or money refunded.

Wyandotte Service Representatives cooperate without obligation, in all parts of U.S.A. and Canada. District Offices in 27 Cities.

THE J·B·FORD COMPANY
WYANDOTTE MICHIGAN

"Let us not pretend that government remains merely the umpire of this domestic strife, or that any of the contestants are innocent of efforts to make government a partisan and to use governmental force to help them win private victories," Mr. Richberg said. "Law after law is passed solely to give economic advantage to some special interest. In the name of preserving competition, laws are cleverly written, deviously interpreted and harshly enforced, in order to cripple effective competition and thus to help inefficiency and incompetency to survive. In the name of liberty, laws are sought and obtained which license one economic group to attack another while tying the hands of the opposition so that its defeat may be assured.

"Thus government neglects its obligation to provide the means of preserving peace; and thus belligerent citizens are encouraged to neglect their obligations to the vast majority of their fellow citizens who wish to live and work in peace."

"Political Interference" Blamed for Present Economic Ills

The Advertising Federation of America, whose convention was held coincidentally with that of the National Association of Industrial Advertisers, adopted a resolution which placed the blame for present economic conditions on "political interference." The resolution said:

"It becomes increasingly apparent that a major cause for the decline is that of political interference, creating uncertainty, disturbing the morale of the people, hampering and discouraging business leaders, burdening trade with excessive costs and restrictions which throttle the volume of sales and create unemployment."

This resolution came as an almost direct answer to the charge made in a convention speech by Thurman W. Arnold, First Assistant Attorney General of the United States, that high prices "artificially maintained" by large industries are responsible for the present slump. Mr. Arnold took a fling particularly at the steel industry.

"For example," he said, "the price of steel for building supplies is higher by $7 a ton in the midst of the present recession than it was in 1929. Partly as a result of these prices the industry is operating today at 30 per cent capacity, and it is predicted that early in July it may drop below 20 per cent capacity. The shock of the business recession is not reflected in reduced prices, but payrolls have declined 55 per cent during the last year."

The Advertising Federation's resolution listed six points that need correction in order to bring about business recovery. These are:

"1. The system of free competitive enterprise, which has built our splendid material progress, is being menaced by unreasoning interference with the necessary voluntary procedure of business in acting for the reciprocal interest of buyer-seller, producer-consumer, employer-employee.

"2. There has been created a state of fear and uncertainty which takes the heart out of business venture and constructive planning.

"3. Capital and labor are being pitted against each other by demagogic utterances instead of being harmonized by Government in the intimate mutual partnership which alone can produce more wealth for all the people.

"4. Trade is being stifled by burdensome costs, arbitrarily raised more abruptly than industrial efficiency can

CLEVELAND TRAMRAIL

MATERIALS HANDLING EQUIPMENT

• Cleveland Tramrail as part of the assembly line.

• A lifting beam raises the empty carrier and motor rack above the horizontal to start it by gravity to the head of the line for reloading.

ALSO BUILDERS OF

CLEVELAND CRANES

FOR EVERY INDUSTRY

CLEVELAND TRAMRAIL

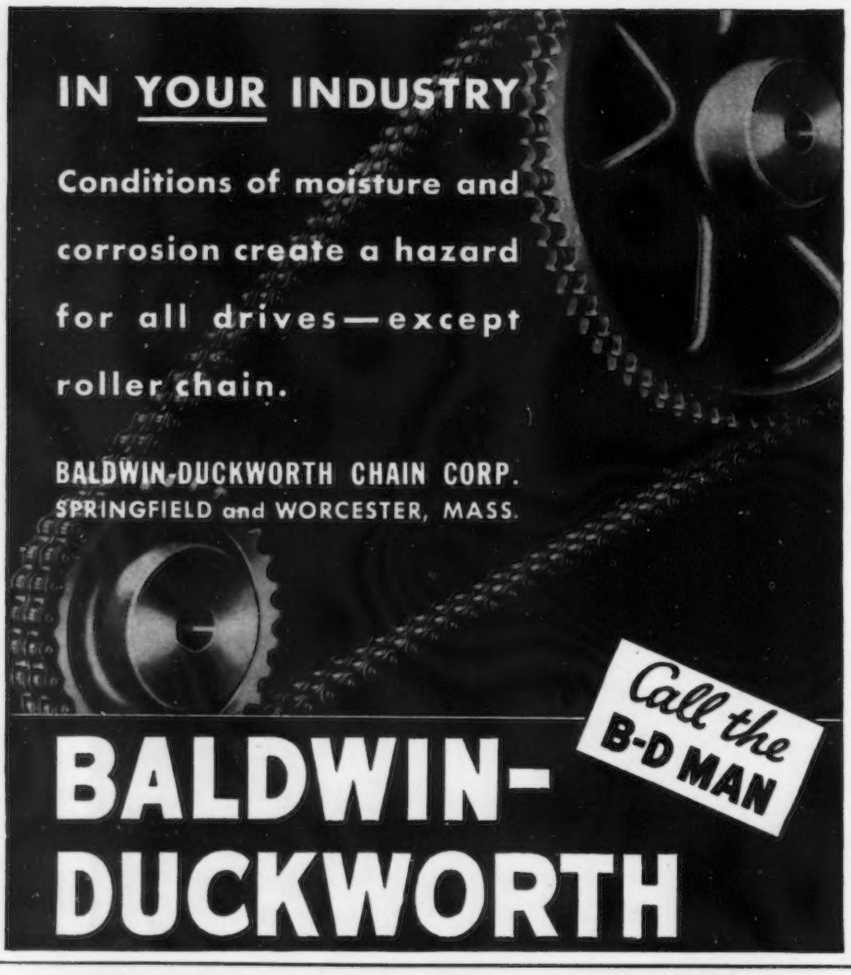
Division of

THE CLEVELAND CRANE & ENGINEERING CO.

1115 Depot St.

WICKLIFFE, OHIO

Or consult your phone directory under Cleveland Tramrail.

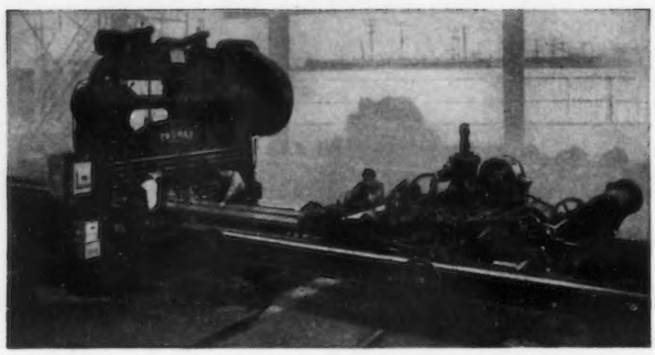

IN YOUR INDUSTRY
Conditions of moisture and corrosion create a hazard for all drives—except roller chain.
BALDWIN-DUCKWORTH CHAIN CORP.
SPRINGFIELD and WORCESTER, MASS.
Call the B-D MAN
BALDWIN-DUCKWORTH

PUNCHES • SHEARS • SPACING TABLES

PRESSES • DIES • METAL-FORMING MACHINERY

BENDING AND STRAIGHTENING MACHINES • MULTIPLE DRILLS

The Top-Ranking Spacing Table



● Thomas has pioneered spacing tables for industrial use for over twenty years. The illustration shows an automatic Thomas spacing table with multiple punch. Write for complete information about Thomas fabricating equipment of all kinds.

THOMAS
MACHINE MANUFACTURING COMPANY

Name changed from Thomas Spacing Machine Co.

PITTSBURGH, PA.

FABRICATING MACHINERY

now absorb and by taxes that are higher than ever before in our history.

"5. Business as a whole is being assailed and maligned for the misconduct of a relatively few who are not representative of the great body of honest, responsible business men in this country.

"6. The fallacious idea is being propagated that the producers of goods and their consumers have adverse interests, whereas they are in fact, mutual partners, indispensable to one another, every consumer being a producer in some form or other and dependent upon production for a livelihood. Business without profit means men without jobs."

Streamlining Trend In Machine Tools

STREAMLINING for appearance, incorporation of more and better safety features to protect workmen, and the provision of more mechanical and hydraulic operating features to reduce fatigue are among the most important design trends in machine tools, according to W. A. Hart, chief engineer, Colonial Broach Co. Speaking before the Works Foremen's Club in Fort Wayne, June 9, on the subject of "Broaches and Broaching Machines," Mr. Hart said that today the mechanical performance of machine tools is taken almost as much for granted by customers as the mechanical reliability of an automobile.

"While streamlining is coming in strong in the machine tool field for appearance reasons primarily," Mr. Hart continued, "the cleaning up of exteriors and provision of smoother shapes also provide definite operating advantages. Such machines are easier to keep clean and stimulate the operator psychologically to keep his tools in better condition.

"Floor space continues to be regarded as an important factor in the selection of machine tools," Mr. Hart said. An important contributing factor in this respect, he believed, was that machine tools occupying small floor space reduce handling of parts between operations. As in other types of machinery, broaching machines, he added, were being provided with better safety controls—frequently of the dual type—so that operators would have to have both hands away from the work before the machine can be started.

Tool Engineers Visit Wright Aero Plant

THE Wright Aeronautical Corp., Paterson, N. J., was host to members of the New York-New Jersey Chapter of the American Society of Tool Engineers on June 14. All manufacturing departments were thrown open to the visitors who showed great interest in the high precision operation on aircraft engine parts. Many of the highly stressed parts are made of nitralloy steel, hardened and ground all over. Even such minor parts as studs have threads ground from the solid, and all gears have ground teeth. Every important part is magnafluxed several times during the course of manufacture. Hundreds of thousands of dollars worth of equipment has been installed in the past year, and much of this new machinery was in evidence.

The Wright plant is one of the few in the country that is working on a three-shift basis, five days a week. K. E. Sutton, production manager, one of the speakers at a meeting following a dinner in the plant cafeteria, said that out of 3700 employees, 2000 were production workers, most of whom were compensated on a group bonus plan. Other speakers included Remo Rege, manager of the production engineering department, William D. Kennedy, service manager, and Raymond Young, assistant chief engineer. Mr. Young said that fuels of 95 octane rating and higher are now standard with the Army and Navy, permitting the use of higher compression ratios, increased thermal efficiencies and better fuel economy.

William P. Brown, general superintendent of the company, himself a member of the A.S.T.E., welcomed the group on behalf of the company and introduced the speakers. C. Frank Sheeley, chairman of the chapter and supervisor of tool design of the Hyatt Bearings Division of General Motors, responded for the society.

Fan Manufacturers to Meet in Detroit on July 20

DETROIT. — A meeting of the National Association of Fan Manufacturers will be held July 20 in Detroit, when further consideration will be given to the work undertaken by the engineering committee.

On or before July 1, 1938, there will be available two new booklets published by the association covering the third edition of "The Standard Test Code for Centrifugal and Axial Fans" and the second edition of "Standard Methods Adopted for Centrifugal Fans and Blowers."

RAMSEY DUPLEX CHAIN

Positive! But Flexible!!

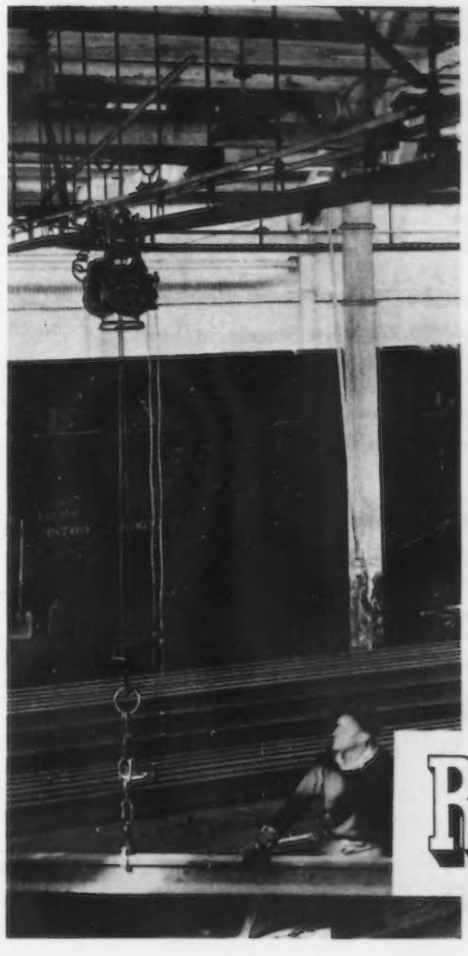
What else but silent chain could be selected for a positive drive to insure fixed R.P.M. and yet flexible to drive from both faces without benefit of idlers?

What else but silent chain will operate at high speeds for many years with little or no attention? Use Ramsey Silent Chain for complicated mechanisms and know the drive is dependable for years of efficient service.

Send for folder D-338 describing the new Ramsey Duplex Chain.

RAMSEY CHAIN CO., Inc., 1050 Broadway, ALBANY, N. Y.

RAMSEY SILENT CHAIN DRIVES



How **READING** *works for* **READING**

Modern railroad men know the value of efficient handling equipment as is shown by this scene in the Reading Co. car shops. Two modern handling units—a Reading Electric Hoist and Monorail System—lift and move materials and equipment easily and safely.

Reading installations such as this have taken over the lifting burdens in many plants. They have sliced handling costs every time. Send your specifications—we'll meet them.

READING CHAIN & BLOCK CORP., Reading, Pa.

READING

CHAIN HOISTS · ELECTRIC HOISTS
TRAVELING CRANES · MONORAIL SYSTEMS

Public Relations Work an Important Job for Industry, Says John W. Hill

ADVOCATING a more thorough job of public relations work by industrial companies, John W. Hill, public relations counsel for the American Iron and Steel Institute, declared in an address to the Office Equipment Manufacturers Institute at Toronto, Ont., on June 17 that "most of the antagonism toward business is due to the fact that the public has been brought up on a rich diet of misinformation."

"Once it was sufficient for a business leader to concentrate upon the affairs of his own corporation and his own industry," said Mr. Hill, "but that no longer suffices. Now he must think in terms of the economy of the nation, he must consider political and social trends, and he must even examine with critical eye the economic justification of the service his business performs.

"Business cannot shut its eyes to the great social problems of unemployment, of relief, of security and labor relations which have been thrust upon the country in this complex and perspiring age. Business leadership must convince the public by word and deed that it is as deeply concerned as political leaders with the proper solution for all the momentous problems facing the Government—solutions which will be for the good of all the people and not alone for one class or one pressure group. Industry needs an understanding and grasp of the problems of Government, just as it hopes Government will understand its problems."

Compared with what should be done, the work of public relations has hardly been started, said Mr. Hill. "Many companies are still sitting on their hands," he added, "when they should be filling up the gaps in the front lines. They are inclined to say let the National Association of Manfacturers or the Chamber of Commerce do it. But the whole job of explaining industry to the public cannot be done by one or two national organizations. It cannot be done by a few large companies. Every industry of importance and every company of importance has the duty and obligation of putting its shoulder to the wheel. Its story may be told to a national audience or it may be told locally. Both are important; neither can be neglected with impunity."

Favorable public opinion cannot be gained, however, said Mr. Hill on "a foundation of lies. The first principle of public relations is that the deed must support the word. Industry's public relations cannot be one thing and its private actions and policies something else. The two must be in complete accord."

International Nickel Co. has established a new field office in the Grant Building, Pittsburgh, under the direction of H. V. Beasley, who for the past three years has been attached to the New York office. The main function of this office will be to promote applications of nickel alloy steels and products of the Huntington mill and stimulate interest in nickel cast irons and the use of nickel in non-ferrous alloys.

THE BEST FLOORING

The best flooring in any plant has these two qualities: safety and endurance. Inland 4-Way Floor Plate excels in both.

With equally safe traction in all directions, it helps to speed all plant operations that involve floor movements. Reduction of the slipping and falling hazard prevents accidents and reduces liability.

. . . . And when you consider low maintenance costs, remember that no other material provides the same strength, toughness and resistance to heavy traffic wear as rolled steel. Write for the 4-Way Floor Plate Book.

ORDER IT FROM YOUR DISTRIBUTOR

INLAND 4-WAY FLOOR PLATE

Made by The Inland Steel Co., 38 So. Dearborn St., Chicago

SHEETS STRIP TIN PLATE BARS RAILS TRACK ACCESSORIES PLATES FLOOR PLATES STRUCTURALS PILING REINFORCING BARS

Allegheny and Ludlum Companies Sponsor Steel Exhibit in New York

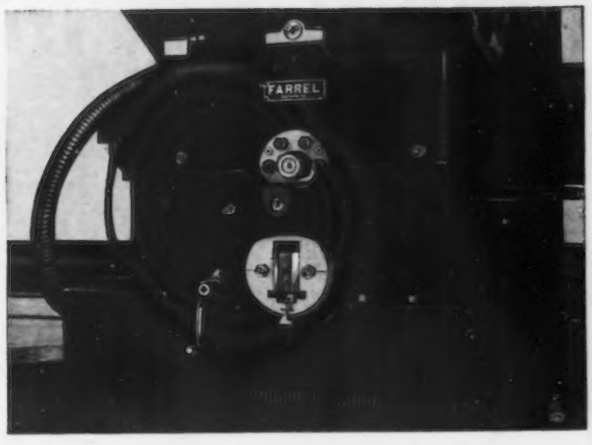
UNDER the auspices of the New York Museum of Science and Industry, a new exhibit, "Steels of Today and Tomorrow" was formally opened in the museum's quarters in Rockefeller Center, New York City, on June 16. The exhibit is sponsored by the Allegheny Steel Co. and the Ludlum Steel Co., both specialists in the field of alloy steels.

A natural color and talking motion picture is in continuous operation. The subjects treated in the exhibits, contrary to custom, are mostly those of consumption and application rather than production. One can also study fabricating devices and welding methods, attention being directed toward the practical functioning of a particular operation in the process of manufacture. To the more highly technical visitor, both Ludlum and Allegheny are giving a glimpse of their latest developments, some of which are hardly beyond the laboratory stage. An example in this category is Ludlum's procedure of coloring stainless steel—not mere applied coloring but coloring which is in the steel and which enhances the corrosion-resisting and stainless properties—color that ranges in fine gradations from a light yellow up to a slate gray which is so dark as to be almost black.

For the casual visitor there are two major displays, partly animated, which forcibly emphasize the adaptability, convenience, sanitation, low cost and beauty of stainless steel in a multitude of home applications both inside and outside. These include Ludlum's new product Ludlite, the emphasis being on the ease with which this paper-thin stainless steel can be handled and by the metamorphosis of a conventional kitchen or bathroom resulting from its judicious application. Alloy steels and their applications are featured in many fields from a full range of tableware, interior and exterior hardware, to the architectural and building fields.

Generous space is devoted also to the new tool steels and their individual use in the manifold operations necessary to produce inexpensive consumer and capital goods of various types. Nitralloy, stainless tubing and wire, Allegheny Metal and Allegheny's various silicon transformer steels are arranged in exhibits which emphatically bring home the fact that to the energy and farsightedness of the steel industry must go the credit for cheaper power and smaller and more dependable equipment for the homes.

H. G. Batcheller, president of Ludlum, emphasized that the objective of the new exhibit is primarily that of functioning as a liaison force between the steel industry and the public. To this end one entire section will be devoted to continuously changing exhibits by various manufacturers of consumer goods regardless of their source of steel supply. In the selection of these special displays, Mr. Batcheller says the sponsors will be guided largely by the judgment of the museum to the end that their main objective be attained.



AUTOMATIC, ACCURATE, SYMMETRICAL ROLL CROWNING *and* CONCAVING

Farrel Heavy Duty Roll Grinders have many other important features which contribute to superior performance, better finish and increased output. Send for a complimentary copy of Bulletin No. 111 which tells about them.

The Farrel crowning and concaving attachment produces a mathematically accurate curve of correct shape for either a crowned or concaved roll, exactly symmetrical on both halves of the roll. The same setting invariably produces exactly the same curvature and permits fixed, uniform and easily controlled accuracy of contour in all rolls.

The device is the adjustable, single eccentric type, built into the wheel head at the rear of the carriage, the design and construction of the mechanism assuring exact synchronism between the wheel carriage and wheel when crowning or concaving a roll. It is designed for ease and simplicity of setting and to produce the exact curvature required. The eccentric and change gears are readily accessible so that settings for any curve can quickly be made.

FARREL FARREL-BIRMINGHAM COMPANY, Inc.
ANSONIA, CONN.
New York • Buffalo • Pittsburgh • Akron • Chicago • Los Angeles

Industrial Lighting Progress Has Increased Efficiency in Factories

CLEVELAND. — How new thinking on the subject of industrial lighting has brought about important developments during the past two years was outlined to a group of lighting specialists from all parts of the nation June 13 to 17 at the General Electric Institute, Nela Park, Cleveland, by numerous authorities.

New industrial lighting equipment which has resulted from the new thinking, in which the Illuminating Engineering Society has played an important role, includes the skylight unit developed for the printing industry, the Equalux unit for the textile industry; the light hood for bench assembly and kindred work where low brightness and a large area of light are desired, and the general lighting unit employing the silver bowl lamp which will be available soon.

The latter unit consists of a porcelain enamel reflector with aluminum insert. The insert has a contour reflecting the light out at angles, resulting in more uniform distribution between units, and softness at the distant viewing down a plant.

The group was told by J. M. Smith of Nela Park how new lighting technique began to be applied about five years ago when the idea of "general lighting, plus" began to come in. Continuing this topic, A. K. Gaetjens outlined uses for supplemental lighting, by which tiring visual conditions are avoided through keeping the light out of the employee's eyes and on the work. By supplemental lighting, general lighting systems of 20 or 30 ft, candles are supplemented by 200 to 300 ft. candles, or more powerful candles if necessary. A good workable ratio, said Mr. Gaetjens, is to have ten times as many foot candles on the work as there are elsewhere in the shop. The heat factor in high-powered lamps is still a drawback and limiting factor, he said, although progress has been made toward tempering this.

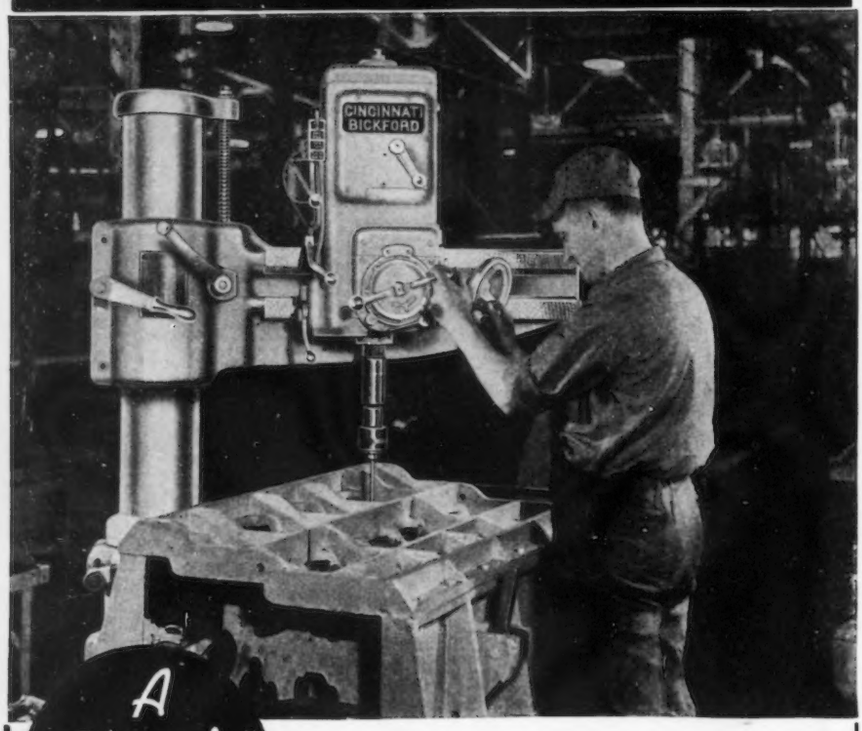
Mr. Gaetjens pointed out that one of the most valuable aids in new lighting technique is the visibility meter. Using this meter, foot candles on the task are divided by the individual's reading of the standard task under 10-foot candles.

Avoiding Reflections and Glare

The problem of avoiding reflections and glare from metal measuring devices was discussed by J. A. Mortensen of Nela Park. Factors affecting the light source reflection from these devices he said include: position of the measuring device with respect to light sources; degree of specularity of the device; curvature of the surface of the scales, micrometers, etc. Uniform brightness must be obtained over the entire scale, he said, and by having proper light quality, appreciable gains are made in visual advantages. Surroundings can often be lightened so that the ten to one ratio between general and supplementary lighting is not exceeded.

The group was shown pictures and statistics obtained in numerous factories throughout the nation prior to installation of modern lighting. In a

CINCINNATI BICKFORD



A New SUPER SERVICE RADIAL

. . *but* already on the job reaming and tapping at Caterpillar Tractor Co.

2½' SENSITIVE
HIGH SPEED
7½" DIA. COLUMN
1-HP. DRIVING MOTOR
AUTOMATIC OILING
ANTI-FRICTION
THROUGHOUT

The machine shown—one of 13 of this size and type in a modern tractor plant—is reaming holes and tapping holes in straight side of 4 cylinder 3¾" bore tractor cylinder blocks. The column of the drill which is 7½" diameter, is mounted directly on the fixture.

Acceptance of these New Super Service Radials by this leading manufacturer for important production work is definite recognition of Cincinnati Bickford quality and the profitable, fast production which characterizes the operation of all Super Service Radials throughout the metal working industries.

Get all the details concerning these new profit makers in hole production. Write today.

The CINCINNATI BICKFORD TOOL COMPANY
OAKLEY CINCINNATI OHIO

plastics factory where defects on bakelite bar knobs for radio panels were a source of worry, 20-ft. candles were found in operation where it was indicated 620-ft. candles were needed to see the task properly. In another plant, a filing machine in a room was being operated under 150-ft. candles with defects in the product frequent, and it was found that 3000-ft. candles were needed. Surveys in foundries, machine shops and other plants were discussed.

W. C. Brown told of the work of the Illuminating Engineering Society and how the code on industrial lighting is being revised. F. E. Carlson gave an illustrated talk on principles of projection systems.

Fabricators Hold Off Pending New Pay Agreements

ST. LOUIS, June 21.—Massman Construction Co., Kansas City, Mo., is low bidder on the general contract for the Grand River Dam and power project at Vinita, Okla., involving 9000 tons of reinforcing bars, 3000 tons of structural shapes and an undetermined tonnage of steel sheet piling. A hospital at Springfield, Ill., will require 500 tons of bars.

Granite City Steel Co. has met the published reduction of $3 a ton on galvanized sheets for third quarter. The announced reduction has made no difference in buying. There has been some buying of sheets for shipment before June 30, when new extras go into effect. This is confined to those items which will be higher in price as a result of the new set up. Buying of structural shapes by fabricators here has been at low ebb, more especially because the present wage agreements expire July 8, and the operators are proceeding cautiously.

Shipments of pig iron during June are expected to be heavier than last month. Melt in the stove foundries in Belleville shows some improvement.

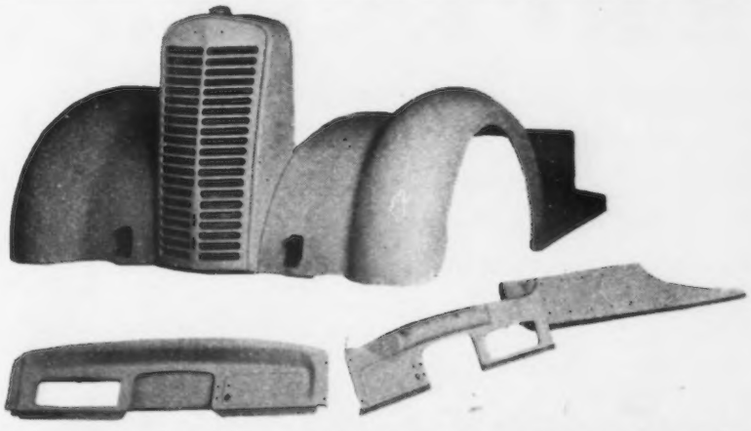
Ohio Roller Gate Dam, Built by Dravo, Dedicated

THE first roller gate dam on the Ohio River, said to contain the highest roller gates in the world, each 125 ft. long and 29 ft. 6 in. high, was dedicated recently. The dam structure is 1149 ft. long and contains nine piers and eight roller gates, with two navigation locks enclosing 16 acres. Dravo Corp., Pittsburgh, constructed the entire project.

Labor Board Move to Dominate City Elections Seen by Armco

MIDDLETOWN, Ohio .— The American Rolling Mill Co. has been informed by Philip G. Phillips, regional director of the National Labor Relations Board, that its motion to make the charges against the company's Ashland, Ky., plant definite and specific had been denied "without prejudice to be renewed before the trial examiner." The complaint charged Armco with vague offenses under the Wagner Act, without specifying when, where, and how they were committed.

However, Phillips took no action on the company's motion to strike out



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Manufacturers of trucks come to York because they know that production schedules will not be interrupted by stampings that fail to come up to specifications. They have endorsed the uniformly fine workmanship that is clearly apparent in every York stamping. They know that trucks, as well as pleasure cars, must have eye-appeal in addition to quality-appeal in order to stimulate consumer interest and desire.

York automotive stampings include fenders, radiator shells and grilles, running boards, running board splashers, and instrument, door, quarter and roof panels.

We are equipped to furnish roll-fenders in various widths, gauges and dimensions.

York also solicits your inquiries on all types of job-stampings other than automotive. Write for full particulars today.

YORK CORRUGATING CO.

YORK, PENNSYLVANIA

charges that Armco had dominated the Ashland municipal elections, company attorneys revealed.

"The company intends to fully press its position with reference to the right of free speech, the right of its officers and employees to participate in municipal elections, unhampered, and free of censorship of the Labor Board," C. H. Murray, assistant to the president of the American Rolling Mill Co., said.

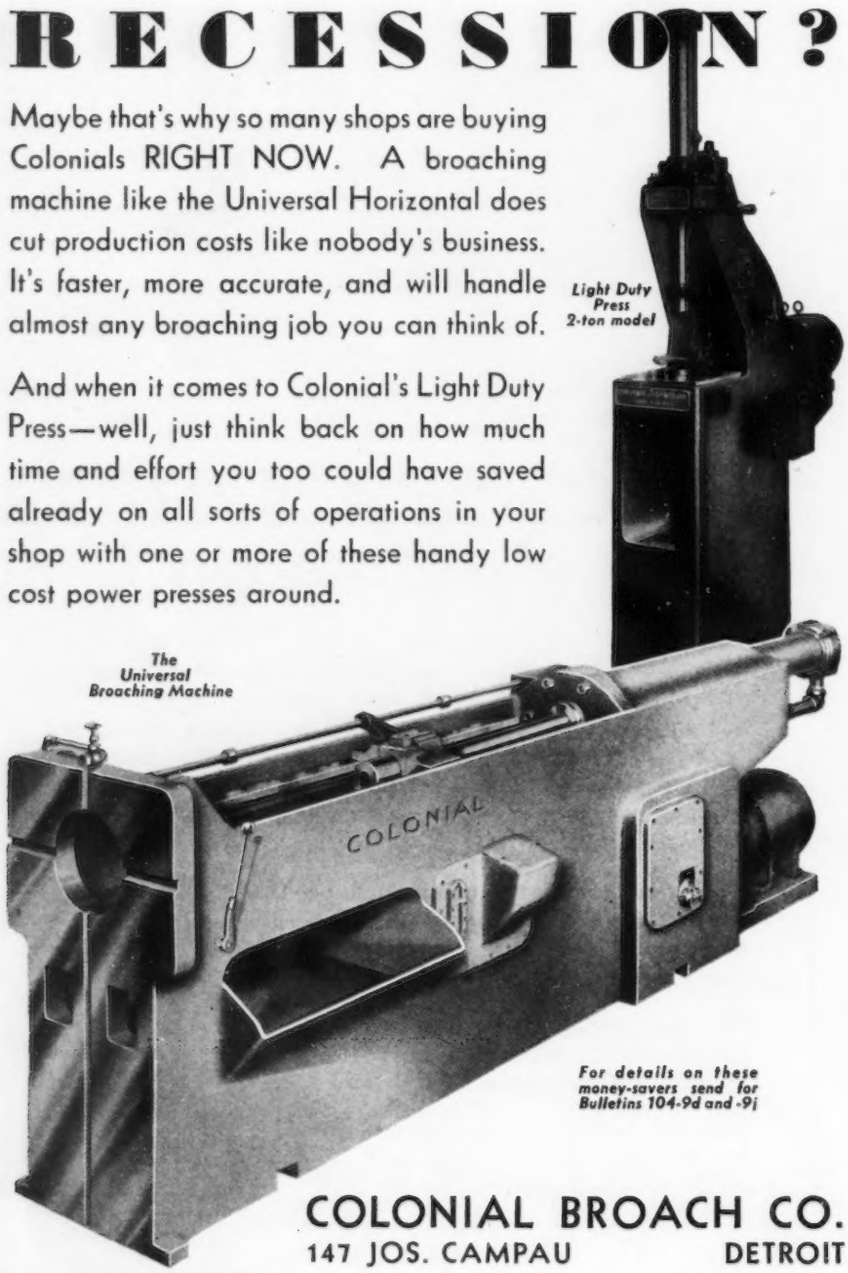
"The complaint clearly attacks the rights of citizens who are working for a company in which the CIO is attempting to forcibly inject itself.

"If this charge is upheld," Mr. Murray said, "no employee of a company can participate in an election without fear of being brought before the Labor Board. In other words, the National Labor Relations Board would be in a position to dominate municipal, state, or national elections."

RECESSION?

Maybe that's why so many shops are buying Colonials RIGHT NOW. A broaching machine like the Universal Horizontal does cut production costs like nobody's business. It's faster, more accurate, and will handle almost any broaching job you can think of.

And when it comes to Colonial's Light Duty Press—well, just think back on how much time and effort you too could have saved already on all sorts of operations in your shop with one or more of these handy low cost power presses around.



Light Duty Press 2-ton model

The Universal Broaching Machine

For details on these money-savers send for Bulletins 104-9d and -9j

COLONIAL BROACH CO.
147 JOS. CAMPAU DETROIT

COLONIAL BROACH COMPANY
147 Jos. Campau St., Detroit, Mich.
Please send further information regarding Colonial Universal Horizontal and Colonial Light Duty Press, and your bulletins Nos. 104-9D and -9J.

NAME .....

ADDRESS .....

$2,500 Paid to Send Two Bearings to Manila by Air

PROBABLY the highest charge ever made for an air express shipment, amounting to $2,500, has just been paid to cover shipment of two Bantam roller bearings from South Bend, Ind., to Manila, P. I., by air. Leaving South Bend Monday night via American Airlines, the bearings were transferred to a United Airlines plane at Chicago for San Francisco. On Wednesday they left by Pan-American Transpacific Clipper for Manila.

Pittsburgh Car Loadings Estimate Off 44% from 1937

PITTSBURGH.—The Allegheny Regional Advisory Board, covering the tri-state area around Pittsburgh, predicts carloadings of 597,962 cars for the third quarter of 1938, an estimated decrease of 33.9 per cent below actual carloadings in the third quarter of 1937. The organization, which has a consistent record for judging car trends, also estimates that iron and steel carloadings will be off 44 per cent from a year ago and coal shipments off 32 per cent from the third quarter of 1937.

Independent Steel Union Scores J. L. Lewis' Lobbying

CHICAGO.—The Steel Workers Independent Union, Inc., with headquarters in Indiana Harbor, Ind., last week scored John L. Lewis for his lobbying activities in behalf of the Walsh-Healey Public Contracts Act. A resolution passed by members charged that passage of the bill would be a menace to liberty and the pursuit of happiness guaranteed by the Constitution, and accused Lewis of dictator motives in trying to secure its enactment.

New England Industry Continues Slight Advance

BOSTON, June 21.—Furnace representatives report sales of small lots of alloys, odds and ends and an occasional carlot of pig iron. Business is reported poorer than in many years.

Industrial New England generally has not slipped, but is holding the slight improvement noted late in May and early June. Most important industrial plants are either planning manufacturing unit extensions or revamping, and giving serious thought to new manufacturing equipment.

. . PERSONALS . .

NEWBOLD C. GOIN has been appointed sales manager of Westinghouse Electric & Mfg. Co.'s gearing division, Nuttall Works, Pittsburgh, succeeding L. R. BOTSAI, recently transferred to the company's small motor division at Lima, Ohio. Mr. Goin has been with Westinghouse since 1917 and since 1924 has been a salesman in the central district.

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GEORGE M. VERITY, chairman of the board, American Rolling Mill Co., Middletown, Ohio, received the honorary degree of Doctor of Engineering from Stevens Institute of Technology at the commencement exercises at Hoboken, N. J., on June 11. Other recipients of the same degree were EDGAR PALMER, chairman of the board, New Jersey Zinc Co., and a trustee of Stevens; ROBERT C. POST, president of Post & McCord, and also a trustee of Stevens; CHARLES ENGELHARD, president of the American Platinum Works, Newark, N. J.; WILLIAM F. GIBBS, vice-president of Gibbs & Cox, consulting marine engineers; and ANDREW M. LOCKETT, president of A. M. Lockett & Co., Ltd., New Orleans.

NEWBOLD C. GOIN

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GORDON S. MEEK has been made president and general superintendent of the Pittsburgh & Conneaut Dock Co., Conneaut, Ohio, and president and general manager of the Pennsylvania & Lake Erie Dock Co., Fairport, Ohio. Both companies are subsidiaries of the U. S. Steel Corp. Mr. Meek has been general superintendent of the Conneaut Dock Co. since 1929 and superintendent of the Fairport Dock Co. from 1907 to 1929. H. D. PROSSER, Painesville, Ohio, has been named vice-president of the Pittsburgh & Lake Erie Dock Co.

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FRANK A. WEISS, who joined the Hyatt Bearings division of the General Motors Corp., in May, 1913, has just completed 25 years of service as purchasing agent for the company.

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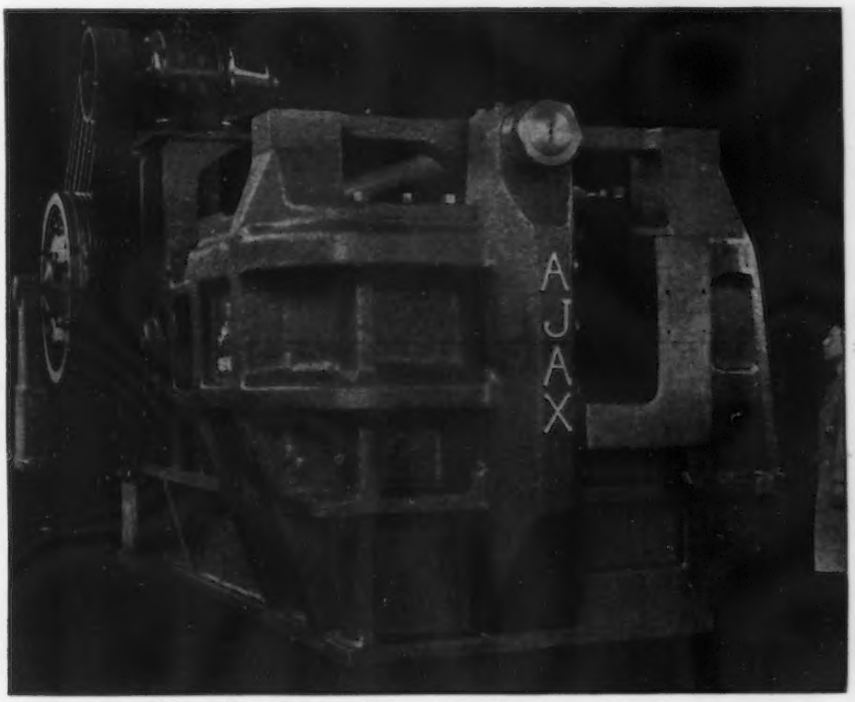
E. F. W. ALEXANDERSON, consulting engineer of the General Electric



A Puff of Air Operates

This Huge Forging Machine!

● **A feather touch on the foot valve—a puff of air—and this huge Forging Machine swings into action! Thousands of times a day in the world's most progressive forge shops, the Ajax Air Clutch is repeating its cycle—daily setting new production records on all types of upset forgings.**

Introduced and patented by Ajax, the Air Clutch won immediate favor with experienced forge men who term it the greatest single improvement in Forging Machines in twenty years. Its smooth, cushioned starting action and instantaneous treadle response has increased production as much as 25% — decreased fatigue of the operator — and totally relieved the machine of damaging clutch impact.

If you are interested in speeding up your forging operations, improving your product and lowering your costs, write today for further information on Ajax Air Clutch Forging Machines — Bulletin No. 65.

THE AJAX MANUFACTURING COMPANY
EUCLID BRANCH P. O. CLEVELAND
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AJAX

Co., Schenectady, N. Y., has been awarded the honorary degree of doctor of philosophy "in absentia" by the Royal University of Upsala, Sweden.

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DOUGLASS W. PEABODY, consulting engineer and for 25 years manager of industrial sales in the Southeast for the General Electric Co., has been named representative of the Trundle Engineering Co., Cleveland, in the district embracing Georgia, Alabama, Tennessee, North and South Carolina. He will make his headquarters in Atlanta, Ga.

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EDWIN J. BAILEY, for the past five years director of credits for American Radiator & Standard Sanitary Corp., has been elected executive vice-president and general manager of William S. Roe, Inc., Newark, N. J.

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JOHN W. BRAFFETT, formerly identified with the Republic Steel Corp., Cleveland, has been made general manager of sales of the Black hardware division of the Oliver Iron & Steel Corp., Pittsburgh. C. E. GUTHRIDGE, formerly manager of sales of the Oliver company has been appointed assistant to the president.

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JAMES A. CRANSTON, commercial vice-president of the General Electric Co. at San Francisco, has retired, after having been identified with the company and its predecessors since 1889.

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G. B. CHILD, for 18 years active in purchasing and cost reduction work, at the Buda Co., Harvey, Ill., and for the past several years a director of the company, has resigned. After a brief vacation he will resume activity in other lines of work.

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ROBERT GREGG, president of the Tennessee Coal, Iron & Railroad Co., has been awarded the annual Georgia Tech medal for distinguished achievement by an alumnus. He was graduated in 1905.

J. W. BRAFFETT

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CHARLES B. SAUNDERS, of the Tennessee Coal, Iron & Railroad Co., has been made chairman of the Birmingham chapter of the American Foundrymen's Association. R. C. HARRELL, Stockham Pipe Fittings Co., has been elected vice-chairman, and W. O. MCMAHON, Sloss-Sheffield Steel & Iron Co., secretary-treasurer.

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A. N. VORIPAIEFF has been appointed to handle Eastern marine sales of wrought iron products of A. M. Byers Co.'s New York office. Mr. Voripaieff was formerly associated with the Reading Iron Co. as assistant manager of New York office and also had been associated with Babcock & Wilcox Tube Co. in a sales capacity.

—the WRIGHT Hoist at the RIGHT time

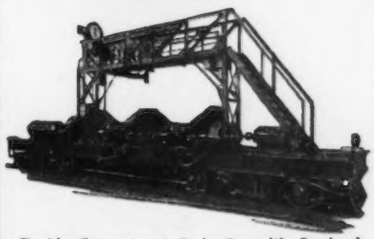
● Wherever, whenever a lift is required the WRIGHT Hoist is the *right* hoist. Twenty-one features of superiority *make* it right. The zinc coated finish defies corrosion. Precision load wheel bearings insure smooth, positive action. Load chain safety guard prevents chain from riding out of pocket regardless of position. Other features listed at left. All types of installations possible. Above photo shows a 6-ton WRIGHT underhung type crane, equipped with a 6-ton WRIGHT Improved High Speed Hoist hooked into a 6-ton WRIGHT Geared Timken Trolley. Write for fully descriptive new WRIGHT CATALOG.

WRIGHT MANUFACTURING DIVISION
AMERICAN CHAIN & CABLE COMPANY, INC.
YORK, PENNSYLVANIA
In Business for Your Safety

ACCO

WRIGHT *Improved High Speed* **HOISTS**

ATLAS CARS



Double Compartment Scale Car with Overhead Operator's Platform. Car provided with Orr Bin Gate Operating Mechanism.

20 Ton Capacity Double Compartment Scale Car for use with Orr type Bin Gates controlled from Operator's Station on Scale Car.

Atlas Products

Gas-Electric and Diesel-Electric Locomotives

Electric Transfer Cars for Blast Furnaces and Steel Plants

Stockhouse Scale Cars for Blast Furnaces

Concentrate and Calcine Cars for Copper Refineries

Automatic and Remote Controlled Electric Cars

Pushers, Levellers and Door Extractors

Coal Charging Lorries, Coke Guides and Clay Carriers

Atlas Patented Coke Quenching Cars for By-Product Coke Ovens

Atlas Patented Indicating and Recording Scales

Special Cars and Electrically Operated Cars for every conceivable purpose

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Engineers - Manufacturers

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J. J. B. RUTHERFORD, formerly of the research laboratory, United States Steel Corp., Kearny, N. J., has joined the metallurgical staff of the Babcock & Wilcox Tube Co. as research metallurgist.

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DR. ALAN MORRIS, formerly research engineer for the Bridgeport Brass Co., Bridgeport, Conn., has been promoted to the position of chief metallurgist. He will be in charge of the physical and chemical laboratories as well as research activities. He has been identified with the company since 1923.

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IRVING L. BAMBRICK has been appointed representative in the New England territory for the Acme Machine Products division of the Serrick Corp., Muncie, Ind. He will make his headquarters at 35 Congress Street, Boston.

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M. V. DREYSPOOL, of 299 Madison Avenue, New York, has been appointed general agent for the United States and Canada for the Globe Wire Die Co., Dijon, France.

❖ ❖ ❖

C. D. MACPHERSON, of the hoist and body division of Gar Wood Industries, Inc., Detroit, has been named a member of the board of directors to serve until 1940 of the American Road Builders' Association.

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STANLEY H. BROWN has been made vice-president and sales manager of Electrol, Inc., Clifton, N. J. J. E. LA BAHN has been appointed assistant vice-president.

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E. J. HERGENROETHER, of the Detroit office of the development and research division of the International Nickel Co., Inc., New York, was scheduled to address the Dayton chapter of the American Society for Tool Engineers on June 20 on the application of alloyed materials to tool and die design.

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ARTHUR W. SCHUSTER, with offices at 1025 Granite Building, Rochester, N. Y., has been appointed representative for the Roots-Connersville Blower Corp., Connersville, Ind., for the 10 counties in the west central part of New York State which lie between Lake Ontario and the Pennsylvania line. JOHN B. FOLEY, JR., 249 Erie Boulevard West, Syracuse, N. Y., is to cover the northeastern section of New York State lying east of the Rochester territory and north of the metropolitan area. F. S. SALCHENBERGER, 211 Wacker Drive, Chicago,

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SUPERIOR STEEL CORPORATION

General Offices
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Works: Carnegie, Pa.

will call upon the pump trade in the northeastern corner of Illinois, as well as three counties in Indiana adjacent to Chicago. B. J. WALTER, 315 West Woodbridge Street, Detroit, will be in charge of turbine pump sales in the southeastern section of Michigan. A. G. BRADBURY, 211 Curtis Building, Detroit, who has been representing Roots-Connersville for several years, continues in charge of the sales of all products, other than the turbine pumps, in the greater Detroit area.

❖ ❖ ❖

JOSEPH L. TRECKER, vice-president, and RALPH BUCK, sales manager, Kearney & Trecker Corp., Milwaukee, are spending about six weeks in the British Isles and Continental Europe to survey business conditions and contact present and prospective customers.

ROBERT GRANT, manager of assembly operations in the Racine, Wis., factory of the Nash Motors Co. division of Nash-Kelvinator Corp., Detroit, has resigned to become vice-president and a director of the Fuller-Johnson Corp., Detroit, manufacturer of electrical appliances. Mr. Grant joined the Nash organization upon his graduation from Cornell University in 1926. He is a native of Brookline, Mass.

❖ ❖ ❖

W. W. ZAHM, for the past 10 years employed in the engineering and fabricating division of Bethlehem Steel Co., Bethlehem, Pa., has been transferred to Cleveland as contracting engineer in the fabricating division. He was graduated from the University of Michigan in 1928.

GOOD FORGINGS *begin here!*

All N.F.O. FORGINGS are manufactured from our own fine quality Basic Electric Steel. Every step in the process is rigidly controlled and supervised.

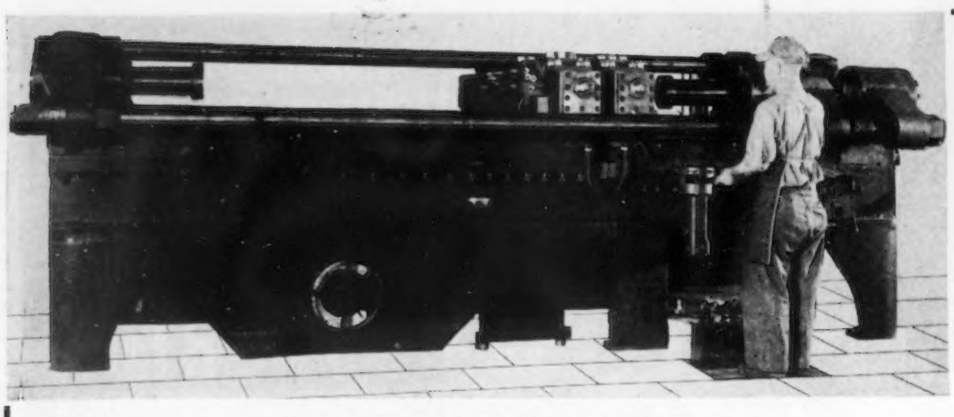
BASIC ELECTRIC STEEL

Carbon, Alloy, Corrosion Resistant and Special Steels, Smooth Forged, Hollow Bored, Rough or Finished Machined, Heat Treated to specifications. Forging Quality Ingots, Pressed or Hammered Billets.

NATIONAL FORGE AND ORDNANCE CO.
IRVINE, WARREN COUNTY, PENNA., U. S. A.

Curtiss Propeller to Move to Clifton, N. J.

THE Curtiss Propeller Division of the Curtiss-Wright Corp. is to be moved from Buffalo to a factory at Clifton, N. J., formerly occupied by the Portable Machine Co. on a site near the engine plant of the Wright Aeronautical Corp., at Paterson, another operating subsidiary, with which engineering and sales are to be coordinated. The Clifton factory consists of a single story brick and steel structure, 460 by 100 ft. which will house all production equipment, and a smaller storage building, 40 by 240 ft. W. K. Swigert, in charge of manufacturing, will start to move machinery from Buffalo immediately, and operations are to be completed between July 15 and Aug. 15. The Curtiss Aeroplane Division remains at Buffalo.

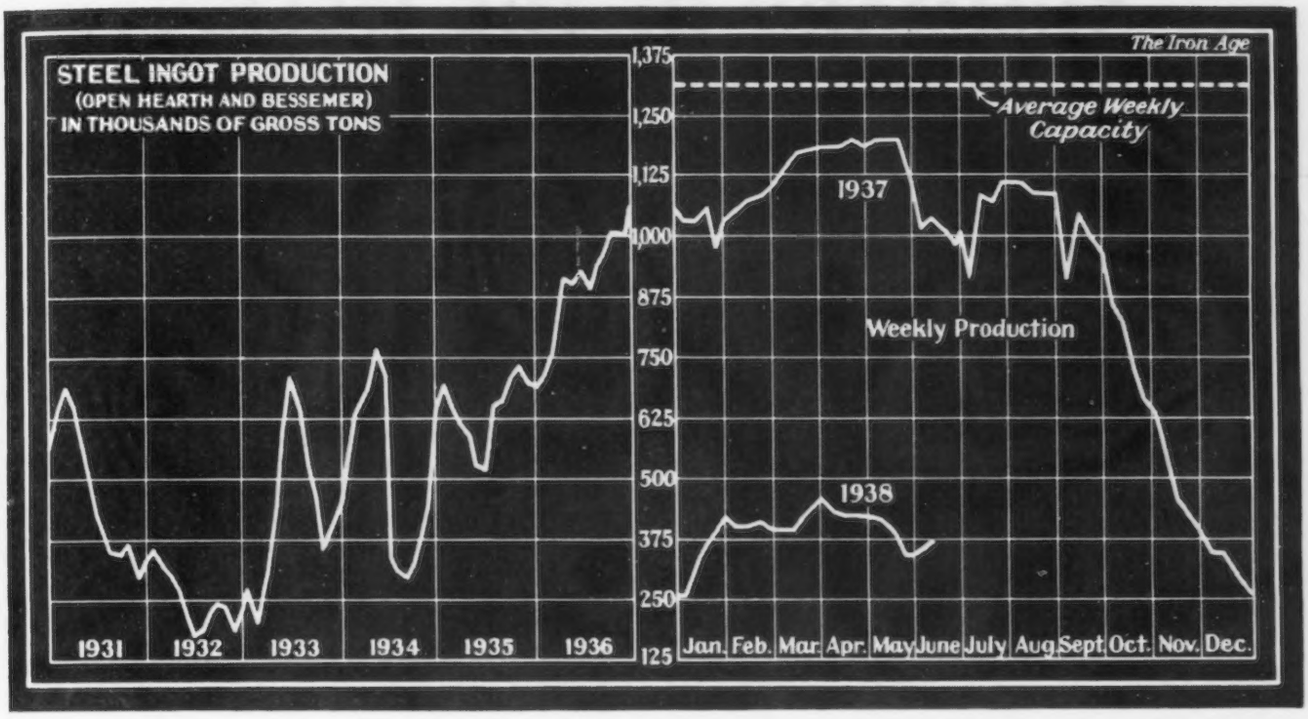


A 750 KV A Swift Flash Welder

SWIFT ELECTRIC WELDER CO.
6560 EPWORTH BLVD., DETROIT

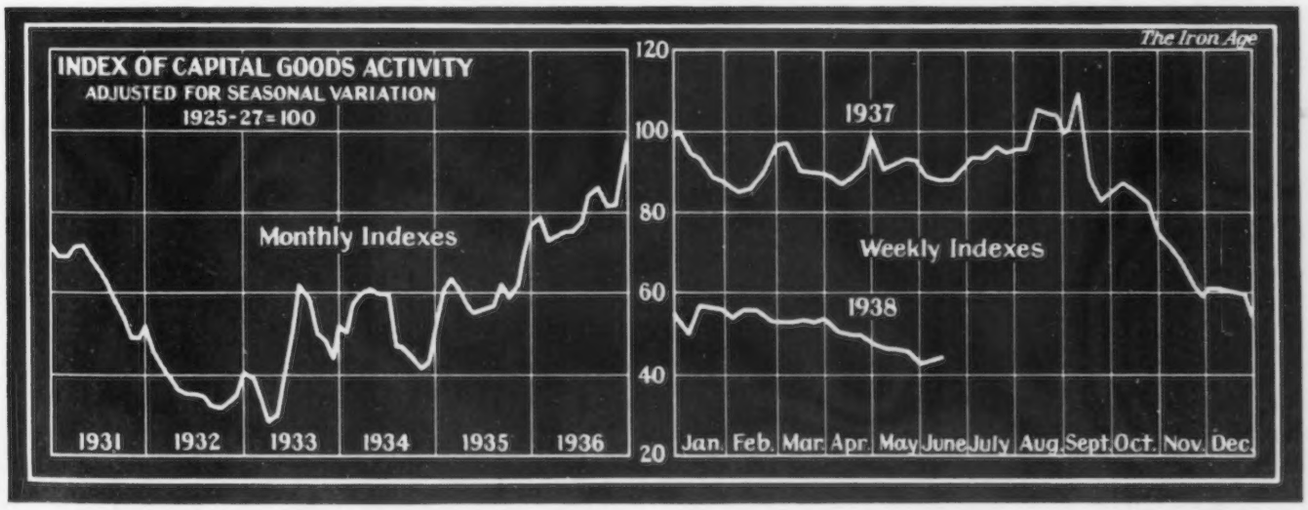
Welding machines hand, hydraulic, cam or air operated of the following types: spot, seam, projection, flash, butt, flue and pipe, also gun welding units.

Steel Ingot Output Rate Rises to 28 Per Cent



District Ingot Production, Per Cent of Capacity	Pitts-burgh	Chicago	Valleys	Phila-delphia	Cleve-land	Wheel-ing	Buffalo	Detroit	Southern	S. Ohio River	Western	St. Louis	East-ern	Aggre-gate
CURRENT WEEK...	22.0	24.5	27.0	22.0	22.0	43.0	28.5	29.5	39.0	18.0	30.0	42.0	10.0	**28.0**
PREVIOUS WEEK..	22.0	23.5	23.0	22.0	23.0	40.0	28.5	19.5	48.0	20.0	30.0	42.0	10.0	**26.0**

Index Shows Small Gain for Second Consecutive Week



MOVING upward 0.4 point to 43.8, THE IRON AGE index of capital goods activity for the week ended June 18 showed the second consecutive gain from the holiday dip of three weeks ago. These gains, however, are so small and so erratic as to render premature any suggestion that the improvement is anything but a temporary fillip. The largest gains for the week were shown by the Pittsburgh and the automobile production series, while the week's heaviest loss was sustained by the construction series. The gain in the Pittsburgh series was due essentially to a marked rise in the volume of both rail and water shipments.

	Week Ended June 18	Week Ended June 11	Comparable Week 1937	Comparable Week 1929
Steel ingot production	34.6	32.6	104.2	137.0
Automobile production	38.1	36.0	101.8	135.2
Construction contracts	55.4	57.8	62.4	122.2
Forest products carloadings	46.6	48.5	70.5	122.2
Production and shipments, Pittsburgh District	44.3	42.2	104.2	128.4
Combined index	**43.8**	**43.4**	**88.6**	**129.0**

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. *Engineering News-Record*; 4. Association of American Railroads; 5. University of Pittsburgh.

. . . .SUMMARY OF THE WEEK. . . .

. . . Steel output climbs to 28 per cent in second consecutive gain.

o o o

. . . Scrap composite price rises 33c., first advance since Feb. 1.

o o o

. . . Quotations on drum stock sheets, reinforcing bars are adjusted.

FOR the first time since late March the national rate of steel plant operations has gained in two consecutive weeks and ingot output is now at 28 per cent, up two points from last week and three points above the 25 per cent rate of two weeks ago.

More important than this modest strengthening of mills' schedules is a growing feeling that business generally this summer will not be so slack as expected and that a foundation for a fair measure of recovery in the fall is slowly being laid.

This week the steel industry notes a strengthening of the scrap market, with THE IRON AGE composite price 33c. higher at $11.33 (the first advance in 20 weeks); it received the first order for steel for 1939 automobiles, found that many buyers inactive since early spring are back in the market, and reported that bookings for most companies are running 10 per cent or more ahead of May.

From most steel producing centers come reports of small rush orders, reflecting scanty inventories, a growing diversification of outlets for the mills and scattered gains in production, with the Wheeling-Weirton area up three points to 43 per cent, Chicago up a point to 24½, Youngstown up four points to 27 and Detroit up 10 points to 29½. Cleveland-Lorain district schedules dipped a point to 22 while Birmingham dropped nine points to 39 and Pittsburgh held unchanged at 22 per cent.

What effect price concessions are having on new business is uncertain. Illustrating the highly competitive nature of the steel industry, prices for some products are subject to concessions. Following the recent reduction of $3 a ton in galvanized sheets, drum stock sheets have been moved down $3 a ton, and reinforcing bars are officially quoted at $5 a ton lower. The price structure faces a further period of testing. This is in direct contrast to the situation in nonferrous metals where efforts of producers, both here and abroad, to balance production with consumption have caused a strongly bullish undertone in all markets, accompanied by expectations of higher prices.

Regarding wages, with which the general steel price structure is considered closely tied, THE IRON AGE has learned that no formal step leading to a reduction in labor rates has been taken, and the leading steel producers apparently still are content to let the business trend over the next few months determine their attitude toward wage revisions.

A strengthening of prices of heavy melting steel scrap at Pittsburgh and Philadelphia helped the scrap composite in its first advance in more than four and one-half months and drew the attention of observers who place reliance in scrap price trends as a steel industry barometer. At Pittsburgh heavy melting steel rose 75c. a ton.

Meanwhile leading outlets for steel showed varying trends. While little railroad buying is looked for this summer, formal orders for 60,000 tons of steel to be used for 5550 cars ordered by Southern Railway are to be placed shortly. The automotive industry shows definite improvement and reports gains in sales and production, contrary to the usual June-July showing, while car registrations in many sections are running ahead of May. Buick has placed its first order for steel for next year's cars, and ingot output from a Detroit steel plant is at the highest level of the year in a move to build up an inventory for anticipated orders from the automotive industry.

Farm equipment production and sales, however, are tapering in a market featured by a reduction of 8 to 24 per cent in prices of tractors and Diesel engines. July is likely to see some of the largest farm implement plants closed for vacations and inventory-taking. Tin plate bookings are heavier, although operations have declined, and sales of wire products are higher this month at some points.

Of remaining large outlets for steel, the shipbuilding and construction industries continue fairly active. Inquiries for structural shapes have increased sharply, but structural lettings declined to 8800 tons this week, compared with 22,500 tons last week, with none of the recent awards more than 750 tons. New projects call for 30,370 tons, against 20,900 tons a week ago. The largest new projects reported are 9000 tons for the Brooklyn municipal subway, 5000 tons for the Pennsylvania Avenue bridge over the Anacostia River at Washington, 2300 tons for a bridge over the North Canadian River at Oklahoma City, and 1200 tons for alterations to the Fifth Avenue Hospital in New York.

Reinforcing steel awards total 7125 tons with 9100 tons pending, including 3750 tons required by U. S. Engineers at Los Angeles for the Hansen Dam.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	June 21, 1938	June 14, 1938	May 24, 1938	June 22, 1937
Rails, heavy, at mill	$42.50	$42.50	$42.50	$42.50
Light rails, Pittsburgh	43.00	43.00	43.00	43.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	37.00
Sheet bars, Pittsburgh	37.00	37.00	37.00	37.00
Slabs, Pittsburgh	37.00	37.00	37.00	37.00
Forging billets, Pittsburgh	43.00	43.00	43.00	43.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	47.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	2.10	2.10	2.10	2.10

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	2.45
Bars, Chicago	2.50	2.50	2.50	2.50
Bars, Cleveland	2.50	2.50	2.50	2.50
Bars, New York	2.81	2.81	2.81	2.78
Plates, Pittsburgh	2.25	2.25	2.25	2.25
Plates, Chicago	2.30	2.30	2.30	2.30
Plates, New York	2.55	2.55	2.55	2.53
Structural shapes, Pittsburgh	2.25	2.25	2.25	2.25
Structural shapes, Chicago	2.30	2.30	2.30	2.30
Structural shapes, New York	2.52	2.52	2.52	2.5025
Cold-finished bars, Pittsburgh	2.90	2.90	2.90	2.90
Hot-rolled strips, Pittsburgh	2.30	2.30	2.30	2.40
Cold-rolled strips, Pittsburgh	3.10	3.10	3.10	3.20
Sheets, galv., No. 24, P'gh	3.65	3.65	3.80	3.80
Sheets, galv., No. 24, Gary	3.75	3.75	3.90	3.90
Hot-rolled sheets, Pittsburgh	2.30	2.30	2.30	....
Hot-rolled sheets, Gary	2.40	2.40	2.40	....
Cold-rolled sheets, Pittsburgh	3.35	3.35	3.35	....
Cold-rolled sheets, Gary	3.45	3.45	3.45	....
Wire nails, Pittsburgh	2.75	2.75	2.75	2.75
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.80
Plain wire, Pittsburgh	2.90	2.90	2.90	2.90
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.95
Barbed wire, galv., P'gh	3.40	3.40	3.40	3.40
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	3.45
Tin plate, 100-lb. box, P'gh	$5.35	$5.35	$5.35	$5.35

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	June 21, 1938	June 14, 1938	May 24, 1938	June 22, 1937
No. 2 fdy., Philadelphia	$25.84	$25.84	$25.84	$25.76
No. 2, Valley furnace	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti	23.89	23.89	23.89	23.69
No. 2, Birmingham†	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago*	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa.	25.34	25.34	25.34	25.26
Basic, Valley furnace	23.50	23.50	23.50	23.50
Malleable, Chicago*	24.00	24.00	24.00	24.00
Malleabl, Valley	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago	30.34	30.34	30.34	30.04
Ferromanganese, seab'd carlots	102.50	102.50	102.50	102.50

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 0.70 per cent or higher.
*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	**$11.50**	$10.75	$11.00	$18.25
Heavy melting steel, Phila.	**12.25**	12.00	12.00	17.25
Heavy melting steel, Ch'go	10.25	10.25	10.75	15.75
Carwheels, Chicago	12.00	12.00	12.50	18.25
Carwheels, Philadelphia	14.75	14.75	14.75	19.75
No. 1 cast, Pittsburgh	13.25	13.25	13.25	18.25
No. 1 cast, Philadelphia	14.25	14.25	14.25	20.25
No. 1 cast, Ch'go (net ton)	10.25	10.25	10.75	15.25
No. 1 RR. wrot., Phila.	15.25	15.25	15.25	19.75
No. 1 RR. wrot., Ch'go (net)	7.75	7.75	8.25	14.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.75	$3.75	$4.00	$4.60
Foundry coke, prompt	4.75	4.75	5.00	5.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	9.00	9.00	9.00	14.00
Lake copper, New York	9.125	9.125	9.125	14.125
Tin (Straits), New York	**42.25**	38.70	37.25	55.65
Zinc, East St. Louis	4.00	4.00	4.00	6.75
Zinc, New York	4.39	4.39	4.39	7.10
Lead, St. Louis	3.85	3.85	4.10	5.85
Lead, New York	4.00	4.00	4.25	6.00
Antimony (Asiatic), N. Y.	14.00	14.00	14.25	14.75

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
June 21, 1938	2.487c. a Lb.	$23.25 a Gross Ton	$11.33 a Gross Ton
One week ago	2.487c.	23.25	11.00
One month ago	2.487c.	23.25	11.25
One year ago	2.512c.	23.25	17.08

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Based on average basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel		Pig Iron		Steel Scrap	
	High	Low	High	Low	High	Low
1938					$14.00, Jan. 4	$11.00, June 7
1937	2.512c., Mar. 9	2.249c., Mar. 2	$23.25, Mar. 9	$20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 16
1936	2.249c., Dec. 28	2.016c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.062c., Oct. 1	2.056c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 23
1934	2.118c., Apr. 24	1.945c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.953c., Oct. 3	1.811c., Apr. 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.915c., Sept. 6	1.877c., Jan. 12	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.981c., Jan. 13	1.883c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.192c., Jan. 7	1.962c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.223c., Apr. 2	2.192c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.192c., Dec. 11	2.142c., July 10	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 17	13.08, Nov. 22

. . . PITTSBURGH . . .

. . . Orders for steel running 10 to 15 per cent ahead of May for some manufacturers . . . Reinforcing bars marked down $5 a ton and drum stock sheets lowered $3 in attempt to stabilize prices . . . Heavy melting steel scrap 75c. higher with district ingot output holding at 22 per cent.

PITTSBURGH, June 21.—New business so far this month is ranging from 10 to 15 per cent ahead of bookings for the same number of days in May. Average orders are not large but there has been a noticeable increase in the number of consumers coming into the market. Final clean up orders on 1938 models has helped out the sheet situation considerably. Whether or not this small but satisfactory improvement in business will continue cannot be told at this time, especially since many manufacturing plants may shut down for a week or 10 days beginning with Independence Day.

Meanwhile, operations in the Pittsburgh district continue unchanged at 22 per cent and the Wheeling-Weirton district has advanced three points to 43 per cent.

Several mills are quoting concrete bars to the contractor trade at $5 a ton under recent published prices, making the new price 2.20c. a lb. f.o.b. Pittsburgh for new billet reinforcing bars. This step in reality is an attempt at stabilization as recent going prices in some locations have been off more than $5 a ton. Drum stock sheets, due to a competitive situation, were being quoted this week at $3 a ton off from the published quotations. However, black sheets are firm at 2.30c. a lb. f.o.b. Pittsburgh, some tonnages having been placed this week by motor makers at the full published price.

No. 1 heavy melting steel is up 75c. this week, being quoted at $11 to $12.

Pig Iron

Pig iron sales improved slightly recently but tonnages booked are not large.

Semi-Finished Steel

Sentiment is slightly better and total semi-finished business has increased moderately in the past week. This improvement is due to a little more activity on the part of non-integrated makers.

Bars, Plates and Shapes

A miscellaneous influx of small orders from jobbers, auto makers and manufacturers has resulted in slightly improved bar bookings. Even though average tonnages placed are not large, diversification appears to be expanding. A substantial increase in structural inquiries has materialized with a majority of projects to be publicly financed. To a limited extent, the same thing is true for structural awards. Fabricated structural prices continue soft in spots.

Reinforcing Bars

Several mills are quoting concrete bars off $5 a ton from present published prices to the contractor trade which in reality reflects a strengthening from recent going prices in some locations. A corresponding reduction is being given jobbers. A number of projects are still pending and new jobs are in slightly better volume.

Sheets

Primarily due to clean-up orders from automobile manufacturers, sheet demand has improved considerably during the past few weeks. However, it is also noticeable that the number of consumers placing small orders has increased considerably in the past few weeks, suggesting that miscellaneous sources will furnish major support in the sheet market until motor companies purchase 1939 model requirements later this year. Drum stock sheets, 20 gage and heavier, turned soft last week when several producers reduced prices on this grade $3 a ton due to a competitive situation.

Tin Plate

Tin plate bookings were slightly better in the past week due to packers' specifications However, no pick up in the near future is anticipated in operations which have slipped a few points this week and are estimated at 35 to 40 per cent.

Wire

Total wire sales continue to show marked improvement from a month ago. Merchant wire business is now more active than manufcaturers' wire specifications. Merchant wire prices are more or less stabilized in the ranges mentioned in this column last week.

Tubular Goods

Tubular sales are about on a par with a week ago but bookings continue less than the volume placed at this time last month. Oil-country goods specifications have declined recently as most drillings are only for protection of leases.

John H. Van Deventer to Speak on Radio June 23

ON June 23 at 8.45 p. m., Eastern daylight time, John H. Van Deventer, editor, THE IRON AGE, will speak on "Men and Machines in the Automobile Industry" over the Blue Network of the National Broadcasting Co.

No Step Yet Taken Toward Steel Wage Cut

UNITED STATES STEEL CORP. subsidiaries have not made a request of the Steel Workers Organizing Committee for a conference at which a reduction in steel wages might be discussed, THE IRON AGE learned this week, following widespread rumors that such a step had been taken.

Frequent meetings have been and are being held between representatives of the corporation and the union on other matters but the question of a general wage revision has not been discussed, THE IRON AGE was told.

New Coal Mine Started

CHRISTOPHER MINING CO., Morgantown, W. Va., and the Pittsburgh & Fairmont Coal Co., Pittsburgh, on June 16 opened Robinson Run No. 2 Mine at Maidsville, W. Va., near Morgantown. This mine represents an investment of approximately $500,000 in modern coal mining and handling equipment and a preparation system for continuous surface cleaning. In full operation the mine has a daily rated capacity of 8200 tons and will employ 500 men.

. . . . CHICAGO . . . .

. . . District operations gain point to 24½ per cent as price concessions reflect unsettled market . . . Orders slightly higher due to miscellaneous buying . . . Prices on tractors and diesel engines quoted at 8 to 24 per cent lower by one manufacturer.

CHICAGO, June 21.—Higher operating schedules at two mills have offset a decline at a third plant resulting in a one point gain, the district now producing steel at 24½ per cent of capacity. Nine blast furnaces continue in operation.

Notwithstanding recent price announcements and assurances to the effect that further reductions will not be given, the minds of most buyers remain unsettled. Since price concessions are being made on several products, purchases still are for immediate use only and stocks are not being built up. Some mills have quoted drum stocks down $3 a ton. Isolated instances of cutting in merchant wire products have been reported but a general condition of this type does not exist. Fabricated shape prices are said to be weak but plain material quotations are firm. The attempt of Missouri mills to stabilize the reinforcing bar market at 2.25c. Chicago on billet steel is not altogether successful, according to reports, and reductions of $8 to $10 a ton still are being reported.

Sales are up slightly in some offices, largely because of miscellaneous ordering. Nothing is in sight from the railroads and the automobile industry is still far from the steel buying stage on its 1939 cars.

Sales of farm equipment are experiencing more than a seasonal drop and leading manufacturers in this district are slowing production more than was anticipated. Sales of all types of equipment are down 30 to 35 per cent from last year. For inventory and vacation purposes the Harvester plants at Rock Island, Ill., and Milwaukee will be closed during July and other plants may be shut down for shorter periods next month also. Price reductions ranging from 8 to 24 per cent have been made on tractors and diesel engines by Caterpillar Tractor Co., Peoria, effective immediately. A slowing down in orders, accumulation of stocks, and a desire to keep employees active were said to have motivated the price slash, which will probably be followed by other makers of diesel and crawler-type tractors.

Pig Iron

Decreases in shipments both of pig iron and foundry coke are being reported for the current month. Prices are firm and a quiet summer is in prospect.

Shapes and Bars

Fabricated shape prices are reflecting considerable weakness, whereas the price of plain material at the mill is reported firm in most instances. The leading shape award and the top inquiry in both shapes and bars, this week, are from Oklahoma where public construction is unusually active. Bar prices continue weak, with large tonnages said to be obtaining quotations $8 to $10 a ton under the published price. Laclede and Sheffield have publicly announced a price of $5 a ton under the market in an attempt to stabilize the price situation in the Central Middle Western States.

Plates

Hopes for important railroad buying are almost abandoned for the summer but increased attention to maintenance of road beds and equipment may result in a fair amount of business. Current demand for plates is almost exclusively from structural fabricators and tank builders, many of the latter being fairly busy.

Sheets and Strip

It is understood that at least four mills have offered a $3 a ton concession on heavy sheets to a manufacturer of drums. Most producers do not know their position on drum stock at present and cannot say what they would quote in answer to a definite inquiry. Some mills have followed the lead of Inland in announcing a 3.75c. Chicago base on galvanized, but business on hand has been insufficient to test this new quotation. Tool and die activity starting up in automobile circles, sheet sellers are hopeful of a resumption of purchasing for 1939 production. Inventories in many local plants are said to be worked down to the point where even a slight increase in business would make steel buying necessary.

Bars

So long as the automobile and railroad industries are out of the market to their present extent, demand for bars cannot be great. Farm implement and tractor buying is still slumping gradually and during July shutdowns for inventory purposes will further lessen the interest of these manufacturers in steel bars.

Wire and Wire Products

Weakness in merchant prices in certain isolated spots in the Middle West has been reported, but sellers do not anticipate a widespread condition of this sort. Nail prices are no better.

. . . . PIPE LINES . . . .

Humble Oil & Refining Co., Humble Building, Houston, Tex., plans new welded steel pipe line from recently opened Dailey oil field in northwestern part of Houston County to connection with main trunk line in southern section of Freestone County, Tex., for crude oil transmission. Booster pumping station will be installed.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until June 30 for two 18-ft. dia. riveted steel penstock liners for Hiwassee power plant for conveying water through Hiwassee dam, a distance of about 275 ft. to hydraulic turbines under a maximum static head of 225 ft.

Ak-Sar-Ben Natural Gas Co., Holdrege, Neb., plans welded steel pipe line from point near Holdrege, where connection will be made with main line, to Bertrand, Neb., about 15 miles, for natural gas transmission to last noted place, where franchise has been granted. Distributing pipe lines will be installed in municipality.

United States Engineer Office, Memphis, Tenn., closes bids June 27 for 38 sections of 32-in. inside diameter steel pontoon pipe, each section 52 lin. ft. long (Circular 306-F).

Pilebur Corp., Lance Creek, Wyo., operating in Lance Creek oil field, Niobrara County, has applied to Colorado Public Utilities Commission for permission to build welded steel pipe line from point noted to Denver for crude oil transmission to oil refineries at latter place. Line will be over 250 miles long. Cost close to $2,750,000 with booster pumping stations and other operating facilities.

Bureau of Reclamation, Denver, has let contract to M. L. Foss, Inc., Denver, at $14,316.58 for steel conduit and fittings for Grand Coulee dam, Wash. (Circular A-38031-A).

Sabinal, Tex., has let contract to Spiller & Miller, Inc., 602 South First Street, Austin, Tex., for pipe lines for a municipal natural gas distribution system. Joseph J. Rady, Majestic Building, Fort Worth, Tex., is consulting engineer.

Northern Natural Gas Co. has awarded 4300 tons of 16-in. steel pipe and 300 tons of smaller diameter feeder line pipe to Republic Steel Corp. for gas line between Ventura, Iowa, and Albert Lea, Minn.

..GREAT BRITAIN..

. . . Europe hopes for upswing following Cartel renewals.

LONDON (*By Cable*).—Continental steel position is unchanged, but some improvement is anticipated now that Raw Steel Cartel has been renewed. Continental sales officers meet at Chateau Dardenne, Belgium, Wednesday, Thursday and Friday to examine price situation. An early conclusion of a comprehensive agreement on American exports expected.

The unfavorable outlook for British iron and steel is worrying producers as consumers are reluctant to purchase ahead and export demand is negligible.

Pig iron is idle and furnace owners are now complaining of the large imports of Indian pig iron which is duty free. Foreign pig iron is being offered cheap but the loyalty rebate to consumers purchasing only British pig iron is restricting purchases of foreign pig iron.

The semi-finished glut is unrelieved. Imports are virtually nil. Heavy steel mills are still active on production but new business is poor.

The tin plate market is dull with unfilled orders under 2,250,000 base boxes. Output is at 38 per cent. Black and galvanized sheets are idle.

United Kingdom exports of pig iron during May amounted to 5300 tons, of which none went to the United States. Total iron and steel exports amounted to 167,500 tons; total imports amounted to 55,600 tons, of which 2800 tons came from the United States, 10,000 tons from Canada and 13,000 tons from British India. The latter was all pig iron.

....BUFFALO....

. . . Steel plants in upstate New York hold gains.

BUFFALO, June 21.—The increase in operations of last week is being maintained but according to mill spokesmen the situation does not warrant the belief that a permanent uptrend in business has occurred.

Bethlehem's Lackawanna plant is operating nine open hearths, Republic Steel Corp. two and Wickwire Spencer Steel Co. one.

A little more activity is apparent in the shape market with some good sized tonnages in the offing. Bar business is practically nil and it is doubtful if the reduced sheet price announced last week brought out any more than ordinary tonnage.

A somewhat encouraging note was the stepping-up of unit production in the local Chevrolet motor plant of 125 additional units a day. The plant's production heretofore has been 150 per day.

Mills believe they are at least holding their own in rolled steel products and that sales may be showing a trace better. Pig iron business shows no improvement with carload lots being accounted good tonnage.

The Buffalo General Electric bus terminal building, to require 125 tons of structural steel, went to a local fabricator. Bids will go in next month for a 600-ton reinforcing flood control project near Binghamton while Orleans County and Monroe County, respectively, are in the market for 200 and 250 tons of steel mesh for road ways.

..SAN FRANCISCO..

. . . Bids close on steel for flood control work.

SAN FRANCISCO. — Columbia Steel Co., San Francisco, appears to be the lowest of a closely bunched group of bidders for furnishing 7721 tons of reinforcing bars to the United States Engineer, Los Angeles. Laclede Steel Co., St. Louis, submitted a slightly lower figure f.o.b. Madison, Mo., but freight charges will nullify this advantage over other bidders quoting f.o.b. site. Identical bids were submitted by Columbia Steel Co., Bethlehem Steel Co., and Inland Steel Co. for furnishing 11,000 tons of sheet piling to the same agency. Both bars and piling will be used in flood control work.

While interest centered on the above openings, Bethlehem Steel Co., Los Angeles, was awarded 1667 tons of reinforcing bars by the Indian Service to be used in Head Gate Rock Dam, Parker, Ariz. Contract for 600 tons of reinforcing bars for the Coulter Dry Goods Co. store, Los Angeles, went to Ceco Steel Products Co. of that city. Five hundred tons for St. John's Seminary, Camarillo, was awarded to Gilmore Fabricators, recently formed San Francisco organization.

Reopening of bids on a Swift & Co. packing plant at Vernon, Cal., brought 800 tons of bars into the market. Some structural steel will also be required for this building. Bids have been opened at Grand Coulee Dam on 4000 tons of bars.

Los Angeles fabricators expect the issuance of specifications within 90 days for completion of the Metropolitan Water Districts aqueduct. This project has already used 17 miles of 51-in. pipe. Approximately 14 more miles of similar pipe will be required to carry it to the harbor.

CANADA

. . . Structural Steel sales improving in Dominion.

TORONTO, ONT.—New business in the Canadian iron and steel markets was comparatively quiet during the past week and sales mostly were in small quantity lots for spot delivery. Substantial additional British contracts are pending but no steps have been taken toward closing new business. Structural steel sales show some improvement. Dominion Bridge Co. has contracted for supplying upward of 5000 tons of steel for the provincial bridge at the east end of Montreal, and new awards totaling some 5000 tons are in prospect for early closing. Warehouse demand for steel is steady with a good market reported for bars and sheets as well as builders' hardware, etc. Steel prices are without change and producers still are working on sheet price revisions.

Merchant pig iron also shows little change from last week. Awards are reported around 2500 tons for spot delivery with producers covered by contract taking schedule delivery. The daily melt continues around 70 per cent. Pig iron production is unchanged and imports are small.

No change is reported in iron and steel scrap. Steel mills are taking delivery of heavy melting steel with odd shipments of turnings. Foundries are in the market for machinery cast, stove plate and there is fair call for wrought scrap. Other lines are spotty and dealers have not started big shipments of scrap to the United States.

. . . CLEVELAND . . .

. . . Youngstown mill schedules climb four points with Cleveland output off slightly . . . Prices of drum stock sheets, reinforcing bars decline . . . Low inventories force more buyers into market . . . Bookings for Ohio producers holding at level of month ago.

CLEVELAND.—With miscellaneous incoming business for steel producers holding at virtually the level which prevailed one month ago, a heartening factor, ingot output for Youngstown and nearby cities this week is up four points to 27 per cent, and in the Cleveland-Lorain district down one point to 22 per cent.

Optimism has been more pronounced since Congress adjourned without enacting some of the restrictive measures which were before it. Prospects of Government spending have led several equipment companies in this area to start producing for potential sales in the fall. While activity of certain other fabricators is waning and there will be many vacation shutdowns in July, this is partially offset by low consumer inventories which necessitate the reordering of small amounts more frequently than earlier this year.

On a large percentage of business being booked by mills, current prices are not being challenged. There have been several recent changes forced however. Due to a competitive situation, the domestic drum stock market was jolted off $3 a ton last week. Another price development, long anticipated, is the general reduction this week of $5 per ton on billet steel reinforcing bars to contractors and jobbers. The published price to contractors is now 2.25c. here.

The raw materials markets remain quiet. Ore consumption during May was roughly only one-third of the amount consumed in May, 1937. One steel company is reported inquiring for 60,000 tons of fluxing stone, which is approximately half of the amount it consumed last year.

Pig Iron

The market continues to drift along with consumers still hesitant to stock. Prices are steady by reason of lack of large tonnages and due to the fact wages and other costs remain frozen at high levels. On such single carload orders as are being received, practically the only pressure for lower prices is coming from jobbing foundries. Operations of consumers remain low, with the likelihood that vacation shutdowns will be numerous in July.

Bars, Shapes and Plates

The expected readjustment of reinforcing bar prices has been made, and represents a $5 per ton reduction from the published prices prevailing up to June 20. At Cleveland, Buffalo, Youngstown, Chicago, Gary and Birmingham the new price to contractors is 2.25c. for billet steel bars in straight lengths. Merchant bar prices have not been affected. Truscon Steel Co., Youngstown, is the low bidder on 300 tons of reinforcing bars for WPA use in Cuyahoga County, Ohio.

Iron Ore

Consumption of Lake Superior iron ore in May amounted to 1,711,146 gross tons as compared to 1,853,658 tons the previous month and as against $5,339,925 tons in May a year ago, according to the Lake Superior Iron Ore Association. Ore on hand at furnaces and Lake Erie docks June 1 was 33,011,974 gross tons as compared with 33,676,333 gross tons on May 1 and compared to 18,799,568 tons on June 1 last year. There were 60 furnaces using Lake ore in blast May 31 compared to 64 on April 30, and 138 on May 31, last year.

Tubular Goods

Oil-country casing requirements show signs of further dullness. Seasonal activity in standard pipe is fairly well maintained.

Sheets and Strip

Domestic orders so far this month are comparable to the corresponding May period. In the case of at least one automobile manufacturer the date for the buying of steel for the first of the 1939 models has been delayed another month. Drum stock has been sold in the domestic market at 2.15c., off $3 a ton, due to a competitive situation. Manufacturers of steel barrels have been encountering erratic conditions in their own market for several months. Black sheet quotations are holding firm.

Wire and Wire Products

Conditions in these markets are without any outstanding change from last week. Activity in merchant wire products is better maintained than the other lines but prices in the secondary market are still very shaky in various sections of the nation. Demand from abroad has helped rod, barbed wire and nail sales.

Bolts, Nuts and Rivets

The decision of automotive producers to maintain assemblies over the next few weeks has heartened bolt and nut manufacturers, many of whom are hopeful that the foundation is now being laid for better business conditions. Small rush orders indicate automotive producers are literally scraping the bottom of their bins.

. . . CINCINNATI . . .

. . . Orders estimated holding at third of capacity.

CINCINNATI, June 21.—Galvanized sheets weakened during the early part of the past week, but came back with vigor following announcement of the new 3.65c. base price. Rural consumption of galvanized sheets is largely responsible for the sustained demand. Other types are holding. An analysis discloses a general average from February to date of about 33 to 35 per cent of capacity, which is still the new business level. Automotive ordering is still small, but mill operators anticipate possible opening of automobile specifications within a month and the possibility of fair expansion from this source within 60 to 90 days.

Pig iron is still lethargic. New business is in small quantities while shipments tend slower. Prices on both northern and southern iron are unchanged and offer no incentive to heavy anticipatory ordering. Foundry operations are unchanged from last week.

Darwin & Milner, Inc., Cleveland, manufacturer of tool steels, has appointed as agencies the Coulter Sibbett Steel Co., 240 Eighth Street, Oakland, Cal., and E. C. Swan, 1650 Pearl Street, Denver.

FABRICATED STEEL

. . . Lettings decline to 8800 tons from 22,500 tons last week . . . New projects higher at 30,370 tons . . . Plate awards call for 6500 tons.

NORTH ATLANTIC STATES

AWARDS

700 Tons, New York, British Pavilion at World's Fair, to Bethlehem Steel Co., Bethlehem, Pa.

420 Tons, New York, telephone building, 221 East 37th Street, to Ingalls Iron Works Co., Birmingham; John Lowery, Inc., general contractor.

325 Tons, Salem, N. J., warehouse and carbon building, Anchor Hocking Glass Co., to Bethlehem Steel Co., Bethlehem, Pa.

200 Tons, West Newton, Mass., school building, to A. O. Wilson Structural Co., Boston.

200 Tons, Schenectady, N. Y., service building, New York Power & Light Corp., to Clausen Iron Co., Inc., Albany, N. Y.

150 Tons, Katonah, N. Y., head frames for shafts, Delaware Aqueduct, Seaboard Construction Corp., to American Bridge Co., Pittsburgh.

145 Tons, Creedmoor, N. Y., addition to reception building, State Hospital, to Schacht Steel Construction Co., New York; Albert & Harrison, Inc., general contractor.

140 Tons, Essex County, N. Y., State highway bridge, to Ingalls Iron Works Co., Birmingham; Triangle Contractors, Inc., general contractor.

140 Tons, Buffalo, Seneca Terminal Station, to R. S. McMannus Steel Construction Co., Buffalo.

125 Tons, New York, curbing for highway approach, Triboro Bridge Authority, to Bethlehem Steel Co., Bethlehem, Pa.

100 Tons, Stowe, Vt., State bridge, to Bethlehem Steel Co., Bethlehem, Pa.

SOUTH AND SOUTHWEST

1100 Tons, Oklahoma City, Okla., North Canadian River bridge, to J. B. Klein Iron & Foundry Co., Oklahoma City; Ottinger Bros. Co., Hinton, Okla., general contractor.

295 Tons, Beverly, W. Va., dimension mill, to International Steel Co., Evansville, Ind.; Hays & Nicoulin, general contractor.

260 Tons, Glen Raven, N. C., State highway project, to Caroline Steel & Iron Co., Greensboro, N. C.; Muirhead Construction, general contractor.

240 Tons, Resaco, Ga., railroad bridge, to American Bridge Co., Pittsburgh.

160 Tons, Ashland, Ky., Kress store, to Meehan Steel Products Co., Ironton, Ohio; Frank Messer & Sons, Inc., Cincinnati, general contractor.

CENTRAL STATES

655 Tons, Westville, Ill., coal tipple, Peabody Coal Co., Allen & Garcia, Chicago, engineers, to Pan-American Bridge Co., Newcastle, Ind.

375 Tons, Rochester, Minn., Mayo Civic Auditorium, to Des Moines Steel Co., Des Moines, Iowa; G. Schwartz & Co., Rochester, general contractors.

200 Tons, St. Louis, warehouse, Steel Sales Corp., to Superior Structural Steel Co., St. Louis.

162 Tons, Stilesville, Ind., bridge, to Pan-American Bridge Co., Newcastle, Ind.; Robert H. King, general contractor.

160 Tons, Jacksonville, Ill., municipal power plant, to Illinois Steel Bridge Co., Jacksonville, Ill.

125 Tons, Chicago, Chicago Molded Products Co. plant; Enjay Construction Co., Chicago, to Wendnagel & Co., Chicago.

110 Tons, Cass County, Mo., bridge, to Builders Steel Works Co., Pittsburgh; Royce Zink, Appleton City, Mo., general contractor.

WESTERN STATES

750 Tons, San Francisco, trusses and beams for Forts Funston and Cronkhite, to J. H. Pomeroy, San Francisco, erector.

540 Tons, San Francisco, War Department, magazine casements, to American Bridge Co., San Francisco.

288 Tons, San Francisco, Federal building at World's Fair, to Moore Dry Dock Co., Oakland, Cal.

200 Tons, Los Angeles, tunnel support ribs for Metropolitan Water District, to Commercial Shearing & Stamping Co., Youngstown, Ohio.

195 Tons, Los Angeles, Queen of Angels Hospital addition, to Consolidated Steel Corp., Los Angeles; R. J. Chutes, general contractor.

165 Tons, Mineral and Archuleta Counties, Colo., to Midwest Steel & Iron Works Co., Denver.

150 Tons, Portland, Ore., Airport Road overcrossing, to Poole & McGonigle, Portland, Ore.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

9000 Tons, Brooklyn, sections seven and eight, route 110, municipal subway; bids received by Board of Transportation, New York, until July 8.

5090 Tons, Washington, Pennsylvania Avenue bridge over Anacostia River.

2100 Tons, Brooklyn, public schools Nos. 244 and 213; bids in.

1300 Tons, Bayonne, N. J., transit shed; Bethlehem Steel Co., low bidder.

1200 Tons, New York, alterations to Fifth Avenue Hospital.

350 Tons, New Brunswick, N. J., factory building, Mutual Sunset Lamp Co.

240 Tons, Branford, Conn., seesaw lift bridge.

200 Tons, Tunbridge, Vt., two State bridges.

190 Tons, Chenango, N. Y., State highway bridge RC-3967.

135 Tons, New York, building alterations, 647 Fifth Avenue Corp.

125 Tons, Mifflin Junction, Pa., Allegheny County bridge.

SOUTH & SOUTHWEST

3000 Tons, Vinita, Okla., Grand River Dam and power project; Massman Construction Co., Kansas City, Mo., low bidder on general contract.

2300 Tons, Hart County, Ky., State bridge over Green River.

2200 Tons, Texas and Oklahoma, Red River bridge.

2000 Tons, Austin, Tex., bridge in Wilbarger County; bids in.

300 Tons, Hobbs Island, Ala., Chickamauga dam cranes.

240 Tons, Okarche, Okla., bridge; bids in.

CENTRAL STATES

1200 Tons, Kansas City, Mo., bridge over Big Blue River; bids June 28.

400 Tons, Bureau, Ill., Rock Island railroad bridge; bids June 25.

250 Tons, Mackinac County, Mich., grade separation bridge for State.

160 Tons, Painesville, Ohio, municipal power plant; DeHamel Construction Co., Cleveland, low bidder.

150 Tons, Kalamazoo, Mich., municipal lighting plant.

135 Tons, Clinton County, Ohio, grade separation.

125 Tons, Moville, Iowa, State bridges, project P-11.

125 Tons, Kalamazoo, Mich., power house; bids in.

WESTERN STATES

1500 Tons, Big Creek, Cal., dam facing, Southern California Edison Co.

550 Tons, Los Angeles, Hansen Dam; bids Aug. 8 to U. S. Engineers.

180 Tons, Terrace Heights, Wash., bridges, Yakima Ridge Canal, for Bureau of Reclamation.

175 Tons, Parco, Wyo., framing for Seminoe power plant, for Bureau of Reclamation.

FABRICATED PLATES

AWARDS

6500 Tons, New York, Manhattan land section, Queens-Midtown tunnel, to Bethlehem Steel Co., Bethlehem, Pa.

Malleable Founders Elect Frank Parker

WHITE SULPHUR SPRINGS, W. VA.—Frank O. Parker, sales manager of the Acme Steel & Malleable Iron Works, Buffalo, was elected president of the Malleable Founders' Society at the industry's annual meeting here. John Wagner, president, Wagner Malleable Iron Co., Decatur, Ill., was elected vice-president. In an address Mr. Parker said:

"Our situation requires that we be candid in revealing our objectives and articulate regarding our functions so that we may beget proper appreciation for our industry's place in the national business pattern."

. . PHILADELPHIA . .

. . . Eastern Pennsylvania operations unchanged at 22 per cent . . . Budd Co. to be in the market for 55,000 lb. of stainless steel . . . Every steel maker reports improved buying tone . . . Scrap displays considerable strength.

PHILADELPHIA, June 21.—Sentiment in the steel industry here has undergone a typical quick reversal, the ruling feeling at the moment being one of cautious optimism tempered with surprise at a noticeable lift in consumer inquiries a month to six weeks ahead of the time when any such change had been anticipated. It is certainly a fact, however, that most producers are selling more steel currently than was the case two weeks ago, and the trend in sales totals seems to be still modestly upward. Some setback in this trend is generally anticipated sometime during early July, but that there will be a secondary revival of more encouraging proportions in the fall is now taken somewhat for granted.

Whereas steel prices during the inactivity of the past quarter were fairly stable, it is unfortunately true that now when buying appears more encouraging the price situation on certain grades is wabbly. Reinforcing steel, long suffering from drastic cuts in the hands of secondary sellers, has definitely been marked down $5 a ton by mills, and drum stock is teetering a little although quotations in this immediate neighborhood have undergone no serious cutting. Other quotations at the moment appear quite stable.

So far, operations in eastern Pennsylvania have not reacted to the better selling volume, the aggregate rate remaining unaltered at 22 per cent. Ingot stocks, never heavy, are being thinned out, and that the district rate will show slight improvement over the month's end is seemingly assured.

The Budd Mfg. Co. is in the throes of a burst of activity, what with an unexpected heavy release from Chevrolet on 1938 auto models, for which considerable new sheet tonnage had to be purchased. In addition, an order for 10 more stainless trailers will take 35,000 lb. of stainless steel, and a new order for four large oil tanks for trucks involves 20,000 tons of stainless sheets.

The construction steel markets are in a state of lethargy, the week's only shapes disposal being 210 tons to Bethlehem for head frames at the Ashley, Pa., mine of Glen Alden Coal Co. The only active project of any size is the 4500 tons required by the Pennsylvania Avenue bridge at Washington.

Pig iron is moving in comparatively fair volume, but no recent improvement in deliveries is noticeable. Scrap, currently very strong in tone, is establishing higher price levels, with further increases likely.

REINFORCING STEEL

. . . Awards of 7125 tons; 9100 tons in new projects.

AWARDS

2200 Tons, Washington, Government printing office, to Sweet Steel Co., Williamsport, Pa.

1667 Tons, Parker, Ariz., Head Gate Rock Dam (Indian Service), to Bethlehem Steel Co., Los Angeles.

650 Tons, New York, Triboro Bridge, contract WB-6, approach, piers and end ramps of Bronx-Whitestone bridge, to Jones & Laughlin Steel Corp., Pittsburgh, through Corbetta Construction Co., contractor.

600 Tons, Los Angeles, Coulter Dry Goods Co. building, to Ceco Steel Products Co., Los Angeles.

500 Tons, Camarillo, Cal., St. John's Seminary, to Gilmore Fabricators, San Francisco.

300 Tons, North Bergen, N. J., approach foundations, Lincoln Tunnel, to Bethlehem Steel Co., Bethlehem, Pa.

200 Tons, Santa Barbara County, four bridges, to Blue Diamond Co., Ltd., Los Angeles.

190 Tons, Odair, Wash., Grand Coulee project (Invitation A-38071-A), to Bethlehem Steel Co., Seattle.

150 Tons, Boston Navy requisition No. 40-X860, to Bethlehem Steel Co., Bethlehem, Pa.

130 Tons, Valley Springs, Cal., two bridges, to Ceco Steel Products Co., San Francisco.

125 Tons, Binghamton, N. Y., engineering and shop buildings, Agfa Ansco Corp., to Truscon Steel Co., Youngstown, through Wark & Co., Philadelphia.

100 Tons, Indianapolis, Link Belt Co. power house, to Truscon Steel Co., Youngstown, through Lundoff-Bicknell, Cleveland.

100 Tons, Los Angeles, Placerita Canyon bridge, to Soule Steel Co., Los Angeles.

100 Tons, El Monte, Cal., high school, to Consolidated Steel Co., Los Angeles.

100 Tons, Los Angeles, Cal., Hollywood Legion Stadium, to Soule Steel Co., Los Angeles.

NEW REINFORCING BAR PROJECTS

9000 Tons, Vinita, Okla., Grand River Dam and power project; Massman Construction Co., Kansas City, Mo., low bidder on general contract.

3750 Tons, Los Angeles, Hansen Dam; bids Aug. 8 to U. S. Engineers.

800 Tons, Vernon, Cal., Swift & Co. packing plant.

197 Tons, San Francisco, United States Engineer; bids opened.

680 Tons, Brooklyn, sections seven and eight, route 110, municipal subway; bids received by Board of Transportation, New York, until July 8.

600 Tons, Whitney Point, N. Y., flood control project; United States Engineers' office, Binghamton; bids about July 1.

500 Tons, Springfield, Ill., St. John's Hospital.

500 Tons, Cambridge, Mass., Lever Bros. building.

450 Tons, Baltimore, United States Engineers proposal 174-38-207; bids opening June 22.

300 Tons, Columbus, Ohio, rail steel bars for Cuyahoga County, WPA invitation; Truscon Steel Co., Youngstown, Ohio, low bidder.

275 Tons, Little Rock, Ark., U. S. Engineers flood wall.

250 Tons, Monroe County, N. Y., road mesh; bids this week.

200 Tons, Orleans County, N. Y., road mesh; bids this week.

198 Tons, Detroit, WPA inquiry; bids opened June 21.

188 Tons, Corona, Cal., railroad and highway relocation; bids postponed to July 5.

162 Tons, Saugus, Cal., Santa Clara River bridge; bids July 7.

150 Tons, Minneapolis, General Electric Co. warehouse.

137 Tons, Coalinga, Cal., high school.

130 Tons, Rumsey, Cal., Cache Creek bridge; bids July 6.

110 Tons, Wooster, Ohio, sewage treatment plant; Holmes Construction Co., Wooster, Ohio, low bidder.

100 Tons, Sacramento, Cal., foundations for State office building No. 3; bids June 28.

100 Tons, Los Angeles, University of Southern California buildings.

100 Tons, Kalamazoo, Mich., power plant.

100 Tons, Cincinnati, Jewish hospital.

. . . . NEW YORK. . . .

. . . Business somewhat better but price weakness is spreading . . . $3 a ton cut on drum stock . . . Plate prices soft . . . Concessions take many forms.

NEW YORK, June 21.—Except for spreading weakness in prices, the steel situation looks somewhat better. Several steel companies had a larger volume of orders in the past week than in any week in months. A significant factor is that some consumers have ordered steel for the first time since early spring, indicating the need of inventory replenishment.

Price weakness is becoming a subject of common discussion. Although there have been reports of concessions during the past month or more, they have in many instances been difficult to prove. Now, however, concessions are more openly discussed by both buyers and sellers.

The recent break in galvanized sheet prices has been followed by concessions of $3 a ton on heavy gage hot rolled sheets used by drum and barrel manufacturers. Fabrication-in-transit rates have been rather freely granted on some jobs that under the conditions that prevailed a year ago would not have been considered as entitled to them. Buyers have been quoted as saying that they have obtained the quantity differentials allowed on 150-ton lots without placing a definite order for that quantity.

In the reinforcing bar market mills are accepting some of the attractive tonnage at prices below the published levels.

A New York jobber bid 75 per cent off list on bolts and nuts to the Department of Purchase, New York City, but it is stated that this material was in stock and had been made up especially to New York City specifications.

Pig Iron

There has been no change in the situation in this district. Foundry operations are in the neighborhood of 25 per cent of capacity and buyers continue to cover only to the extent of their immediate requirements.

Plates and Sheets

Accusations of price cutting are heard among plate sellers. Most sellers admit that on large public projects they would underbid the market. Miscellaneous plate business is dragging along at low levels, with the tendency downward for most district offices.

One sheet seller reports substantially better volume for the past two weeks, equal to all of January sales, but this spurt is not typical of the local market. Jobber sales of galvanized sheets are still low, but some of them have bought a carload or two at the new base price and the smallness of their commitments indicates a lack of confidence in the new set-up. The new base took cognizance of an already existing situation, but the underlying weakness still persists.

Reinforcing Bars

The volume of awards in the past week was substantially lower than in the preceding week. The largest award of the past week was for an approach to the Lincoln Tunnel, calling for 300 tons and placed with Bethlehem Steel Co. Pending tonnages are fairly heavy and include 1500 tons for a Brooklyn sewer that is yet to be placed by the Luang Construction Corp., Brooklyn, general contractor. The only new inquiry is for two sections of the municipal subway in Brooklyn, taking 680 tons. Prices are generally unsettled. Several small lots were recently purchased by the Treasury Department at prices ranging from $10 to $14 a ton below the recent published base of 2.45c., Pittsburgh.

Industrial Rivet Makers Are Enjoined From Price Fixing by FTC

WASHINGTON.—The Federal Trade Commission has announced the issuance of a cease and desist order against 11 manufacturers of industrial rivets, prohibiting them "from entering into and executing any price-fixing agreement or understanding among themselves or with any members for the purpose or with the effect of restraining, monopolizing or eliminating competition."

The respondents are:

Shelton Tubular Rivet Co. and Shelton Tack Co., both of Shelton, Conn.; Tubular Rivet & Stud Co., Boston; Judson L. Thomson Mfg. Co., Waltham, Mass.; Milford Rivet & Machine Co., Milford, Conn.; Chicago Rivet & Machine Co. and Manufacturers Belt Hook Co., both of Chicago; National Rivet & Mfg. Co., Waupun, Wis.; Townsend Co., New Brighton, Pa.; John Hassall, Inc., Brooklyn, and J. W. Coombs Mfg. Co., Inc., Fort Washington, Pa.

The order also is directed against the Institute of Tubular-Split and Outside Pronged Rivet Manufacturers, of which the respondent companies are or have been members, and against William Fleming, Jr., president of the institute, which has headquarters at Waupun, Wis.

Under the order the respondents are prohibited from engaging in the following practices as part of their agreement:

(1) Fixing and maintaining uniform delivered prices for their products; (2) inducing members of the industry by intimidation or persuasion to raise their quoted prices to the uniform delivered prices established under the agreement, and (3) holding meetings of the institute to devise methods of asserting influence, pressure or coercion for the purpose of requiring producers of industrial rivets to fix or maintain prices, or to publish established prices, or to adhere to any uniform price list resulting from the respondents' agreement.

The order provides that nothing in it shall prevent the lawful gathering, compilation and distribution to the trade of statistics, including discounts, net prices, terms and conditions of sale, and other particulars of closed transactions.

The complaint in the proceeding is dismissed as to Penn Rivet Corp., Philadelphia, because of its dissolution in May, 1937. Dismissal of the complaint also is ordered as to Scoville Mfg. Co., Waterbury, Conn., because there is no evidence showing that it participated in the acts and practices charged.

. . .NON-FERROUS. . .

. . . Output restrictions strengthen all non-ferrous markets . . . Foreign copper prices advance sharply as heavy buying develops . . . Tin quotations move higher as additional 10 per cent is cut from marketable quotas.

NEW YORK, June 21.—The reduction in the output of foreign copper and tin announced last week, together with the closing down of several non-ferrous mines in this country, was reflected in a growing bullishness on the part of both speculators and consumers. This sentiment was not so pronounced here as it was in foreign markets where prices have shown daily gains since Friday of last week. The reduction in the production quotas of foreign producers of 10 points to 95 per cent was credited with being responsible for the increase in the sales of the copper cartel members from 900 tons on Saturday to 4361 tons yesterday. This morning's sales by the cartel group totaled 4500 tons, at prices as high as 8.93c. per lb., c.i.f., with sellers predicting that 9.05c. would be reached before the end of the day. Buying for armament purposes is still the dominating factor. Domestically the volume of sales continues very light, the total for the month through Saturday being 12,600 tons. The firmness of the foreign market has removed all doubts concerning the steadiness of the present domestic quotation of 9c. per lb., Connecticut Valley, for electrolytic metal. Outside prices have advanced to 8.75c., with offerings limited.

The Week's Prices. Cents Per Pound for Early Delivery

	June 15	June 16	June 17	June 18	June 20	June 21
Electrolytic copper, Conn.*	9.00	9.00	9.00	9.00	9.00	9.00
Lake copper, N. Y.	9.125	9.125	9.125	9.125	9.125	9.125
Straits tin, spot, New York	39.125	39.75	40.75		41.50	42.25
Zinc, East St. Louis	4.00	4.00	4.00	4.00	4.00	4.00
Zinc, New York	4.39	4.39	4.39	4.39	4.39	4.39
Lead, St. Louis	3.85	3.85	3.85	3.85	3.85	3.85
Lead, New York	4.00	4.00	4.00	4.00	4.00	4.00

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
Aluminum, virgin, 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 14.00c. a lb., prompt, f.o.b., New York.
Antimony, American, 11.75c. per lb., prompt shipment, New York.
Quicksilver, $82.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 9.25c. a lb., less carload, delivered in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	43.00c. to 44.00c.
Tin, bar	45.00c. to 46.00c.
Copper, Lake	10.00c. to 11.00c.
Copper, electrolytic	10.00c. to 11.00c.
Copper, castings	9.50c. to 9.75c.
*Copper sheets, hot-rolled	17.125c.
*High brass sheets	15.625c.
*Seamless brass tubes	18.375c.
*Seamless copper tubes	17.625c.
*Brass rods	11.625c.
Zinc, slabs	5.50c. to 6.50c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.50c.
Lead, American pig	5.00c. to 6.00c.
Lead, bar	5.75c. to 6.125c.
Lead, sheets, cut	7.25c.
Antimony, Asiatic	15.25c. to 16.25c.
Alum., virgin, 99 per cent plus	22.50c. to 24.00c.
Alum., No. 1 for remelting, 98 to 99 per cent.	19.50c. to 21.00c.
Solder, ½ and ½	29.00c. to 30.00c.
Babbitt metal, commercial grade	19.50c. to 49.50c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 25 per cent allowed off for extras, except copper sheets and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	45.50c.
Tin, bar	47.50c.
Copper, Lake	10.00c. to 10.25c.
Copper, electrolytic	10.00c. to 10.25c.
Copper, castings	9.75c.
Zinc, slabs	7.00c. to 7.25c.
Lead, American pig	4.50c. to 4.75c.
Lead, bar	7.75c.
Antimony, Asiatic	17.75c. to 18.00c.
Babbitt metal, medium grade	19.75c.
Babbitt metal, high grade	49.50c.
Solder, ½ and ½	26.75c.

Old Metals Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers Selling Prices
Copper, hvy. crucible	6.25c.	7.00c.
Copper, hvy. and wire	5.50c.	6.00c.
Copper, light and bottoms	5.00c.	5.25c.
Brass, heavy	3.25c.	3.75c.
Brass, light	2.50c.	3.25c.
Hvy. machine composition	5.00c.	6.50c.
No. 1 yel. brass turnings	3.50c.	4.50c.
No. 1 red brass or compos. turnings	4.50c.	5.00c.
Lead, heavy	3.125c.	3.50c.
Cast aluminum	5.00c.	6.25c.
Sheet aluminum	8.75c.	10.25c.
Zinc	1.625c.	2.875c.

Lead

The market last week was moderately active with sales dropping about 17 per cent below the previous week's level. This market remains the most active of all the major non-ferrous markets and is supported by well diversified buying. Delivery preference has been switched to June as the end of the month approaches, and quotations are steady and unchanged at 4c. per lb., New York. Production of lead in May was 32,977 tons, or 6314 tons less than in April. Shipments in May were 26,011 against 25,592 in the preceding month, and stocks at the end of the month stood at 163,723 tons, a gain of 7008 tons over the April stock position.

Zinc

Further curtailment of output was announced by several producers in the past week, adding strength to the present quotation of 4.39c. per lb., New York. Prime Western sales last week, at 1874 tons, showed a slight drop from the previous week's figure. Shipments also declined, totaling 1800 tons for the week. Unfilled orders at the end of the week amounted to 24,601 tons. Spelter prices in London this morning followed the other non-ferrous metals to higher ground, with prompt metal being quoted at 2.91c. per lb.

Tin

Quotations in the past week moved steadily upward in sympathy with the London Exchange, and today's price of 42.25c. per lb., New York, for Straits metal is 3.55c. above the price of a week ago. Anticipation of the action of the Control Committee in taking 10 per cent additional out of third quarter quotas, for the Buffer Pool, leaving a marketable quota of 35 per cent, was chiefly responsible for the strength abroad. Although sales in London were fairly heavy all week, domestic sellers report no change in the dull conditions prevailing in the market here. On first call in London today, cash standards were quoted at £184 and three months' metal at £185, the highest prices reached since March 22.

IRON AND STEEL SCRAP

. . . Average turns upward for first time in six months . . . Export buying prices also higher.

JUNE 21.—For the first time since the end of December, scrap prices have turned upward. Due to advances in prices for No. 1 steel at Philadelphia and Pittsburgh, the composite figure is now $11.33, as against $11 last week. Chicago prices are unchanged. The high level of $14 maintained all through January was eroded to $11 in middle June, from which point an apparent recovery is starting as dealers find increasing difficulty in picking up No. 1 steel at current levels. The feeling is better in most markets, although aside from those mentioned there are few price changes to prove it. Bundles are up 50c. at Detroit, but No. 1 steel and some railroad items are off at St. Louis.

Buying prices for export material are higher at both Boston and New York, where the margin of profit on the last cartel sale is being reduced to a negative quantity. Material is coming out much less freely than was the case a few months ago.

Pittsburgh

The scrap market is much stronger this week with dealers experiencing difficulty picking up scrap. One consumer has matched releases on higher priced tonnages bought some time ago with new sales at around $11 a ton. A down river mill purchased about 500 tons of No. 1 steel a few days ago at $11.50 a ton. Some brokers are paying from $11 to $11.50 in covering recent $10.75 and $11 sales. However, some brokers in this territory are offering $12 a ton for No. 1 steel and $11 a ton for No. 2 steel. With dealer offers ranging from $11 to $12 and with a small sale into consumption at $11.50, the situation is covered this week by a $1 spread of $11 to $12 with an average of $11.50 for No. 1 heavy melting.

Chicago

Prices are unchanged this week in the further absence of mill purchasing. A slight increase in open-hearth activity here is not expected to be reflected in the scrap quotations immediately, although an extended rise will, of course, have a bullish effect on the market. Over 16,000 tons of scrap is being offered for sale by several railroads this week and next, including the Milwaukee, Burlington, Illinois Central, Rock Island and Alton. All lists may not be sold because of the low price levels, but it is not believed that the current quotation of $10 to $10.50 for No. 1 steel will be exceeded by a large margin.

Cleveland

For the first time in months there is definitely a better feeling here and dealers profess confidence the market is on the bottom. There are no indications that prices will start rising over the next few weeks, but it is believed in market circles that present levels will at least be held. Excess scrap remains scarce due to shutdowns and reduced operations. Some scrap has been moving to the Youngstown district from Cleveland recently. No. 1 heavy melting steel remains nominally quoted at $10.50 to $11 at Youngstown and $9.50 to $10 at Cleveland.

Buffalo

Strengthening of prices at Pittsburgh has had no apparent effect in this district, except to convince most dealers that the local market is dragging bottom. The price of $10.50 for No. 1 heavy melting steel and $8.50 for No. 2 steel is still available to dealers who care to sell at these prices, but the local mill in the market is not receiving any considerable tonnages, and, with the stiffening influence from outside, may receive even less.

St. Louis

Due to lack of buying by the mills and a freer offering of scrap by the railroads, the market here is slightly off. However, the market here is still higher than prevails in other centers, but it is expected to find itself, with the mills showing no interest. Railroad lists include: Alton, 12,000 tons; B. & O., 11,000 tons; Milwaukee, 4000 tons; Illinois Central, 3500 tons and C. B. & Q., 2500 tons.

Cincinnati

The old materials market remains in a no-activity rut. Reports of export business in other areas failed to disturb local placidity the past week. Dealers' bids are unchanged in the absence of any tests.

Philadelphia

Taking a cue from better sentiment among steel makers, the scrap market here has definitely reversed in price trend, even though some confusion still exists as to whether this reversal will be increasingly accentuated or will bog down early in July. To date, however, two sales of No. 1 steel at a district mill have established a $12.50 top limit to a $12 to $12.50 price spread for this grade. No. 2 and stove plate likewise are up 50c. on recent demands. Several factors are currently evident here—the scrap market has turned considerably faster than most people had anticipated and at the moment it is certainly evident that exporters are going to find it very unprofitable to fill recent orders, and domestic mills on any real demand are most likely to find that the total absence of any distress material will result in considerable price volatility. Scrap accumulations in the Baltimore area are being held for much higher prices than those now ruling, and all holders of stocks in this immediate neighborhood have become extremely coy with regard to selling.

Detroit

Mill buying coaxed into existence by the low prevailing prices has tended to give strength to the Detroit scrap market. Increase in the operating rate of Great Lakes Steel Corp. from four open-hearth furnaces to six was a contributing factor in the better sentiment, although no actual buying resulted from this change in the mill's operation. The sale of hydraulic compressed bundles by Fisher Body Co. for $8.50 was reported, thus setting the level of bundle prices in the absence of any other activity. Further automotive lists will be forthcoming late this week or early next week. Tonnages are expected to be the lightest so far this year because the summer shutdowns in automobile plants will begin during July.

New York

A leading exporter, only lightly involved in the last cartel sales but apparently still covering older orders, has advanced his buying prices 50c. to $1 a ton, and other brokers have raised their offers correspondingly. Truck loads delivered to barges now command $9 to $10 for No. 1 steel and $8 to $8.50 for No. 2, as against $8.50 to $9.50 and $7 to $8 up until Tuesday. (The last cartel price was $10 and $8.50 f.a.s., respectively.) Buying prices for No. 2 cast and stove plate have been advanced $1. Reason given by some is that material is not flowing in fast enough, but charges of "bulling the market" are heard. The weekly flow is estimated at 60 to 75 per cent of what it was a couple of months ago when higher prices were offered.

Boston

Exporters are putting out bids for Nos. 1 and 2 steel, but so far holders have not sold much material. Prices for export material are firmer as a result. The market for No. 1 steel now is not less than $9.50 a ton delivered dock, whereas a week ago, bids ran as low as $9, and No. 2 steel is now $8 to $8.50 a ton, contrasted with $7.50 to $7.75 a week ago. So far as the domestic scrap market is concerned, there is not enough business passing to test prices.

Strike Not Yet Settled at Chicago Hardware Foundry

CHICAGO.—The two weeks' old strike at the North Chicago plant of the Chicago Hardware Foundry Co. was no nearer a solution this week as about 400 CIO pickets were placed about the plant Monday to prevent 200 members of an independent union from returning to work as they had planned.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	$11.00 to $12.00
Railroad hvy. mltng...	12.00 to 12.50
No. 2 hvy. mltng. steel.	10.00 to 11.00
Scrap rails	14.00 to 14.50
Rails 3 ft. and under..	15.00 to 15.50
Comp. steel	11.00 to 12.00
Hand bundled sheets..	10.00 to 11.00
Hvy. steel axle turn...	9.50 to 10.00
Machine shop turn....	6.00 to 6.50
Short shov. turn.....	6.00 to 6.50
Mixed bor. & turn.....	5.75 to 6.25
Cast iron borings.....	5.75 to 6.25
Cast iron carwheels...	12.50 to 13.00
Hvy. breakable cast...	11.00 to 11.50
No. 1 cupola cast.....	13.00 to 13.50
RR. knuckles & cplrs..	14.00 to 14.50
Rail coil & leaf springs	14.00 to 14.50
Rolled steel wheels....	14.00 to 14.50
Low phos. billet crops.	14.50 to 15.00
Low phos. punchings.	13.00 to 13.50
Low phos. plate	12.50 to 13.50

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	$12.00 to $12.50
No. 2 hvy. mltng. steel.	10.00 to 10.50
Hydraulic bund., new.	11.50 to 12.00
Hydraulic bund., old..	8.50 to 9.00
Steel rails for rolling..	16.00 to 16.50
Cast iron carwheels...	14.50 to 15.00
Hvy. breakable cast..	13.00 to 13.50
No. 1 cast	14.50 to 15.00
Stove plate (steel wks.)	11.00 to 11.50
Railroad malleable ...	14.50 to 15.00
Machine shop turn....	.... 6.50
No. 1 blast furnace....	.... 6.00
Cast borings	.... 6.00
Heavy axle turnings...	8.50 to 9.00
No. 1 low phos. hvy...	16.00 to 16.50
Couplers & knuckles..	15.00 to 15.50
Rolled steel wheels ...	15.00 to 15.50
Steel axles	20.00 to 20.50
Shafting	18.50 to 19.00
No. 1 RR. wrought....	15.00 to 15.50
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire.....	9.50 to 10.00
Cast borings (chem.)..	9.50 to 10.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton	
Hvy. mltng. steel.....	$10.00 to	$10.50
Auto. hvy. mltng. steel alloy free	8.50 to	9.00
No. 2 auto. steel	8.00 to	8.50
Shoveling steel	10.00 to	10.50
Hydraul. comp. sheets	9.00 to	9.50
Drop forge flashings...	7.75 to	8.25
No. 1 busheling	8.75 to	9.25
No. 2 busheling, old...	3.25 to	3.75
Rolled carwheels	12.50 to	13.00
Railroad tires, cut....	14.00 to	14.50
Railroad leaf springs..	13.50 to	14.00
Steel coup. & knuckles	12.50 to	13.00
Axle turnings	9.50 to	10.00
Coil springs	14.00 to	14.50
Axle turn. (elec.).....	9.50 to	10.00
Low phos. punchings.	13.00 to	13.50
Low phos. plates, 12 in. and under	12.00 to	12.50
Cast iron borings	3.50 to	4.00
Short shov. turn.....	5.00 to	5.50
Machine shop turn....	3.50 to	4.00
Rerolling rails	13.25 to	13.75
Steel rails under 3 ft..	13.50 to	14.00
Steel rails under 2 ft..	14.00 to	14.50
Angle bars, steel.....	12.00 to	12.50
Cast iron carwheels...	11.75 to	12.75
Railroad malleable ...	11.25 to	11.75
Agric. malleable	9.50 to	10.00
	Per Net Ton	
Iron car axles	16.00 to	16.50
Steel car axles	14.50 to	15.00
No. 1 RR. wrought....	7.50 to	8.00
No. 2 RR. wrought....	8.75 to	9.25
Locomotive tires	13.75 to	14.25
Pipes and flues	7.25 to	7.75
No. 1 machinery cast..	10.00 to	10.50
Clean auto. cast	9.00 to	9.50
No. 1 railroad cast....	9.25 to	9.75
No. 1 agric. cast.....	9.00 to	9.50
Stove plate	6.50 to	7.00
Grate bars	6.50 to	7.00
Brake shoes	6.00 to	6.50

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	$10.50 to $11.00
Hydraulic bundles	10.00 to 10.50
Machine shop turn....	6.50 to 7.00

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	$9.50 to $10.00
No. 2 hvy. mltng. steel.	8.50 to 9.00
Comp. sheet steel	9.00 to 9.50
Light bund. stampings.	6.50 to 7.00
Drop forge flashings...	8.00 to 8.50
Machine shop turn....	4.75 to 5.25
Short shov. turn.....	5.25 to 5.75
No. 1 busheling	8.00 to 8.50
Steel axle turnings....	7.50 to 8.00
Low phos. billet and bloom crops	14.00 to 14.50
Cast iron borings	4.75 to 5.25
Mixed bor. & turn....	4.75 to 5.25
No. 2 busheling	4.75 to 5.25
No. 1 cast	12.50 to 13.00
Railroad grate bars ..	6.50 to 7.00
Stove plate	6.00 to 6.50
Rails under 3 ft.	14.00 to 14.50
Rails for rolling.....	12.00 to 12.50
Railroad malleable	11.50 to 12.00
Cast iron carwheels...	12.00 to 12.50

BUFFALO

No. 1 hvy. mltng. steel.	$10.50 to $11.00
No. 2 hvy. mltng. steel.	8.50 to 9.00
Scrap rails	12.00 to 12.50
New hvy. b'ndled sheets	9.00 to 9.50
Old hydraul. bundles..	7.50 to 8.00
Drop forge flashings..	8.50 to 9.00
No. 1 busheling	8.50 to 9.00
Hvy. axle turnings....	8.50 to 9.00
Machine shop turn....	4.50 to 5.00
Knuckles & Couplers..	14.00 to 14.50
Coil & leaf springs....	14.00 to 14.50
Rolled steel wheels....	14.00 to 14.50
Low phos. billet crops.	15.00 to 15.50
Shov. turnings	6.00 to 6.50
Mixed bor. & turn....	4.50 to 5.00
Cast iron borings	4.50 to 5.00
Steel car axles	14.00 to 14.50
No. 1 machinery cast.	13.00 to 13.50
No. 1 cupola cast.....	12.00 to 12.50
Stove plate	10.50 to 11.00
Steel rails under 3 ft..	15.00 to 15.50
Cast iron carwheels...	12.00 to 12.50
Railroad malleable ...	11.50 to 12.00
Chemical borings	7.50 to 8.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	$10.00 to $10.50
No. 1 hvy. melting0...	10.00 to 10.50
No. 2 hvy. melting....	9.75 to 10.00
No. 1 locomotive tires.	11.50 to 12.00
Misc. stand. sec. rails.	10.50 to 11.00
Railroad springs	12.00 to 12.50
Bundled sheets	5.50 to 6.00
No. 1 busheling	5.50 to 6.00
Cast bor. & turn.....	1.50 to 2.00
Machine shop turn....	1.50 to 2.00
Heavy turnings	7.00 to 7.50
Rails for rolling	13.00 to 13.50
Steel car axles	15.50 to 16.00
Iron car axles	19.50 to 20.00
No. 1 RR. wrought. ..	7.50 to 8.00
No. 2 RR. wrought....	10.00 to 10.50
Steel rails under 3 ft...	13.00 to 13.50
Steel angle bars	11.00 to 11.50
Cast iron carwheels...	11.50 to 12.00
No. 1 machinery cast..	11.00 to 11.50
Railroad malleable	10.00 to 10.50
No. 1 railroad cast	10.00 to 10.50
Stove plate	6.50 to 7.00
Grate bars	7.00 to 7.50
Brake shoes	7.00 to 7.50

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel.	$7.75 to $8.25
No. 2 hvy. mltng. steel.	5.75 to 6.25
Scrap rails for mltng.	12.50 to 13.00
Loose sheet clippings.	3.25 to 3.75
Hydrau. b'ndled sheets	7.25 to 7.75
Cast iron borings	1.75 to 2.25
Machine shop turn....	2.25 to 2.75
No. 1 busheling	6.00 to 6.50
No. 2 busheling	1.25 to 1.75
Rails for rolling	14.50 to 15.00
No. 1 locomotive tires.	11.25 to 11.75
Short rails	15.00 to 15.50
Cast iron carwheels...	9.75 to 10.25
No. 1 machinery cast.	9.75 to 10.25
No. 1 railroad cast....	8.25 to 8.75
Burnt cast	4.75 to 5.25
Stove plate	4.75 to 5.25
Agricul. malleable	9.00 to 9.50
Railroad malleable	11.00 to 11.50
Mixed hvy. cast	6.50 to 7.00

BIRMINGHAM

Per gross ton delivered to consumer:	
Hvy. melting steel	$11.50 to $12.00
Scrap steel rails	14.00 to 14.50
Short shov. turnings..	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought....	.... 10.00
Rails for rolling	15.00 to 16.00
No. 1 cast	14.00 to 16.50
Tramcar wheels	14.00 to 15.00

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	$6.50 to $7.00
No. 2 hvy. mltng. steel.	5.50 to 6.00
Borings and turnings..	3.00 to 3.50
Long turnings	2.75 to 3.25
Short shov. turnings..	3.50 to 4.00
No. 1 machinery cast..	11.50 to 12.00
Automotive cast	11.50 to 12.00
Hvy. breakable cast...	9.00 to 9.50
Hydraul. comp. sheets.	8.00 to 8.50
Stove plate	6.75 to 7.25
New factory bushel...	6.00 to 6.50
Old No. 2 busheling...	2.00 to 2.50
Sheet clippings	4.00 to 4.50
Flashings	5.50 to 6.00
Low phos. plate scrap.	7.50 to 8.00

NEW YORK

Dealers' buying prices per gross ton on cars:	
No. 1 hvy. mltng. steel.	$8.00 to $8.50
No. 2 hvy. mltng. steel.	5.50 to 6.00
Hvy. breakable cast..	9.00 to 9.50
No. 1 machinery cast.	10.50 to 11.00
No. 2 cast	7.00 to 7.50
Stove plate	6.50 to 7.00
Steel car axles	20.00 to 20.50
Shafting	15.00 to 15.50
No. 1 RR, wrought....	11.00 to 11.50
No. 1 wrought long....	9.50 to 10.00
Spec. iron & steel pipe	8.50 to 9.00
Rails for rolling	16.00 to 16.50
Clean steel turnings*..	2.50 to 3.00
Cast borings*	2.50 to 3.00
No. 1 blast furnace...	2.50 to 3.00
Cast borings (chem.)..	9.50 to 10.00
Unprepared yard scrap	4.50 to 5.00
Light iron	3.00 to 3.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast	$13.00 to $14.00
No. 2 cast	10.50 to 11.00

*$1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	$10.75 to $11.00
Scrap rails	10.75 to 11.00
No. 2 steel	9.75 to 10.00
Breakable cast	7.25 to 7.75
Machine shop turn.	1.45
Mixed bor. & turn.	1.25
Bun. skeleton long....	$3.50 to 3.85
Shafting	13.00
Cast bor. chemical	5.50
Per gross ton delivered consumers' yards:	
Textile cast	$12.00 to $12.50
No. 1 machine cast....	12.00 to 12.50

PACIFIC COAST

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	$11.65 to $12.15
No. 2 hvy. mltng. steel.	10.65 to 11.15

CANADA

Dealers' buying prices at their yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel.	$10.50	$9.50
No. 2 hvy. mltng. steel.	9.50	8.50
Mixed dealers steel....	8.50	7.50
Scrap pipe	8.50	7.50
Steel turnings	7.50	7.00
Cast borings	8.50	7.50
Machinery cast	15.00	14.00
Dealers cast	13.00	12.00
Stove plate	11.00	10.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel	$9.00 to $10.00
No. 2 hvy. mltng. steel	8.00 to 8.50
No. 2 cast	8.00
Stove plate	7.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy.. mltng. steel.	$9.50
No. 2 hvy. mltng. steel.	$8.00 to $8.50
Rails (scrap)	9.50
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel....	Nominal
No. 2 hvy. mltng. steel....	Nominal

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

	Per Gross Ton
Rerolling	$37.00
Forging quality	43.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$37.00

Skelp

Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	2.10c.

Wire Rods
(No. 5 to 9/32 in.)

	Per Gross Ton
Pittsburgh or Cleveland	$47.00
Chicago, Youngstown or Anderson, Ind.	48.00
Worcester, Mass.	49.00
Birmingham	50.00
San Francisco	56.00
Galveston	53.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

SOFT STEEL BARS

	Base per Lb.
Pittsburgh	2.45c.
Chicago or Gary	2.50c.
Duluth	2.60c.
Detroit	2.60c.
Cleveland	2.50c.
Buffalo	2.55c.
Philadelphia	2.77c.
New York	2.81c.
Birmingham	2.60c.
On cars dock Gulf ports	2.85c.
On cars dock Pacific ports	3.00c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh	2.30c.
Cleveland, Chicago, Gary or Moline, Ill.	2.35c.
Buffalo	2.40c.
Birmingham	2.45c.
On cars dock Gulf ports	2.70c.
On cars dock Pacific ports	2.85c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh	2.20c.
Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.25c.
Detroit	2.35c.
On cars dock Gulf ports	2.65c.
On cars dock Pacific ports	2.95c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh	2.05c.
Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.10c.
On cars dock Gulf ports	2.50c.
On cars dock Pacific ports	2.80c.

Note: Above prices have been subject to concessions on large jobs.

IRON BARS

Chicago	2.40c.
Pittsburgh (refined)	3.60c.

COLD FINISHED BARS AND SHAFTING*

	Base Per Lb.
Pittsburgh	2.90c.
Cleveland, Chicago and Gary	2.95c.
Buffalo	3.00c.
Detroit	2.95c.

* In quantities of 10,000 to 19,999 lb.

PLATES

	Base Per Lb.
Pittsburgh	2.25c.
Chicago or Gary	2.30c.
Cleveland	2.45c.
Coatesville or Spar. Pt.	2.35c.
Philadelphia	2.445c.
New York	2.55c.
Birmingham	2.40c.
On cars dock Gulf ports	2.65c.
On cars dock Pacific ports	2.80c.
Wrought iron plates, P't'g.	3.80c.

FLOOR PLATES

Pittsburgh	3.50c.
Chicago	3.55c.
Coatesville	3.60c.
On cars dock Gulf ports	3.90c.
On cars dock Pacific ports	4.05c.

STRUCTURAL SHAPES

	Base per Lb.
Pittsburgh	2.25c.
Chicago	2.30c.
Cleveland	2.45c.
Buffalo or Bethlehem	2.35c.
Philadelphia	2.465c.
New York	2.52c.
Birmingham (standard)	2.40c.
On cars dock Gulf ports	2.65c.
On cars dock Pacific ports	2.80c.

STEEL SHEET PILING

	Base per Lb.
Pittsburgh	2.60c.
Chicago or Buffalo	2.70c.
On cars dock Gulf or Pacific Coast ports	.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$42.50
Angle bars, per 100 lb	2.80

F.o.b. Basing Points

Light rails (from billets) per gross ton	$43.00
Light rails (from rail steel) per gross ton	42.00

	Base per Lb.
Spikes	3.15c.
Tie plates, steel	2.30c.
Tie plates, Pacific Coast ports	2.40c.
Track bolts, to steam railroads	4.35c.
Track bolts, to jobbers, all sizes (per 100 counts)	65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

NOTE: Following prices superseded by new base quotations of 2.30c., Pittsburgh, and 2.40c., Gary, on hot rolled sheets; 3.35c., Pittsburgh, and 3.45c., Gary, on cold rolled sheets, subject to new list of extras issued May 18. Until June 30 whichever set of base prices and extras yields lower net will apply.

Hot Rolled, 10 Gage

	Base per Lb.
Pittsburgh	2.40c.
Gary	2.50c.
Detroit	2.60c.
Philadelphia	2.72c.
Granite City	2.60c.
Birmingham	2.55c.
On cars dock Pacific ports	2.95c.
Wrought iron, Pittsburgh	4.25c.

Hot Rolled Annealed, 24 Gage

Pittsburgh	3.15c.
Gary	3.25c.
Detroit	3.35c.
Philadelphia	3.47c.
Granite City	3.35c.
Birmingham	3.30c.
On cars dock Pacific ports	3.80c.
Wrought iron, Pittsburgh	5.15c.

Note: Drum stock quotations have been subject to concessions of $3 a ton.

Heavy Cold Rolled, 10 Gage*

Pittsburgh	3.00c.
Gary	3.10c.
Detroit	3.20c.
Philadelphia	3.32c.
Granite City	3.20c.
Birmingham	3.15c.
On cars dock Pacific ports	3.60c.

Light Cold Rolled, 20 Gage*

Pittsburgh	3.45c.
Gary	3.55c.
Detroit	3.65c.
Philadelphia	3.77c.
Granite City	3.65c.
Birmingham	3.60c.
On cars dock Pacific ports	4.00c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

Galvanized Sheets, 24 Gage

Pittsburgh	3.65c.
Gary	3.75c.
Philadelphia	3.97c.
Granite City	3.85c.
Birmingham	3.80c.
On cars dock Pacific ports	4.25c.
Wrought iron, Pittsburgh	6.10c.

Electrical Sheets
(F.o.b. Pittsburgh)

	Base per Lb.
Field grade	3.35c.
Armature	3.70c.
Electrical	4.20c.
Special Motor	5.10c.
Special Dynamo	5.80c.
Transformer	6.30c.
Transformer Special	7.30c.
Transformer Extra Special	7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	4.10c.
F.o.b. Gary	4.20c.
F.o.b. cars dock Pacific ports	4.80c.

Vitreous Enameling Stock, 20 Gage

Pittsburgh	3.50c.
Gary	3.60c.
Granite City	3.70c.
On cars dock Pacific ports	4.10c.

TIN MILL PRODUCTS

NOTE: Base prices for third quarter unchanged, but will apply only to 29 gage and lighter; all other to be governed by sheet base and extras.

Black Plate, 28 Gage

Pittsburgh	3.30c.
Gary	3.40c.
Granite City	3.50c.
On cars dock Pacific ports, boxed	4.175c.

Tin Plate

	Base per Box
Standard cokes, Pittsburgh	$5.35
Standard cokes, Gary	5.45
Standard cokes, Granite City	5.55

Special Coated Manufacturing Ternes

	Base per Box
Pittsburgh	$4.65
Gary	4.75
Granite City	4.85

Roofing Terne Plate
(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)	
8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

HOT ROLLED STRIP

NOTE: Following prices superseded by new base prices of 2.30c., Pittsburgh, and 2.40c., Gary, subject to new list of extras issued May 18, which provide that base shall apply to strip 12 in. and under; all other to be governed by sheet base and extras. Until June 30 either old or new method may be used.

(Widths up to 24 in.)

	Base per Lb.
Pittsburgh	2.40c.
Chicago	2.50c.
Detroit	2.60c.
Granite City	2.60c.
Birmingham	2.55c.

Cooperage Stock

Pittsburgh	2.50c.
Chicago	2.60c.

COLD ROLLED STRIP*

	Base per Lb.
Pittsburgh	3.10c.
Cleveland	3.10c.
Chicago	3.39c.
Worcester	3.30c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh or Cleveland	3.25c.
Worcester	3.65c.

COLD ROLLED SPRING STEEL

		Pittsburgh and Cleveland	Worcester
Carbon	0.26-0.50%	3.10c.	3.30c.
Carbon	.51- .75	4.45c.	4.65c.
Carbon	.76-1.00	6.30c.	6.50c.
Carbon Over	1.00	8.50c.	8.70c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

	Per Lb.
Bright wire	2.90c.
Galvanized wire	2.95c.
Spring wire	3.50c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland, Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	$2.75
Smooth coated nails	2.75
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	$3.15
Galvanized fence wire	3.55
Polished staples	3.45
Galvanized staples	3.70
Barbed wire, galvanized	3.40
Twisted barbless wire	3.40
Woven wire fence, base column.	74
Single loop bale ties, base col...	63

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh, except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., are $11 a ton over Pittsburgh; New Orleans, $8; Mobile, Ala., $7; Lake Charles, La., $9 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $11 a ton over Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel			*Wrought Iron*		
In.	Black	Galv.	In.	Black	Galv.
⅛	52	31	¼ & ⅜	+13	+35
¼ to ⅜	55	38½	½	20	1½
½	59½	49	¾	26	8
¾	62½	53	1 & 1¼	30	14
1 to 3	64½	55½	1½	34	16½
			2	33½	16

Lap Weld

2	57	47½	2	26½	10
2½ & 3	60	50½	2½ to 3½	27½	12½
3½ to 6	62	52½	4	29½	16
7 & 8	61	50½	4½ to 8	28½	15
9 & 10	60½	50	9 to 12	24½	10
11 & 12	59½	49			

Butt Weld, extra strong, plain ends

⅛	50½	36½	¼ & ⅜	+14	+48
¼ to ⅜	52½	40½	½	21	4
½	57½	48½	¾	27	10
¾	61½	52½	1 to 2	34	17½
1 to 3	63	55			

Lap Weld, extra strong, plain ends

2	55	46½	2	29½	13½
2½ & 3.59		50½	2½ to 4	35	20½
3½ to 6.62		54	4½ to 6	33½	19
7 & 8	61½	54	7 & 8	34½	19½
9 & 10	60½	50	9 to 12	28	15½
11 & 12	59½	49			

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
1 in. o.d. 13 B.W.G.	$ 9.46	$ 8.41	....
1¼ in. o.d. 13 B.W.G.	11.21	9.96	....
1½ in. o.d. 13 B.W.G.	12 38	11.00	$10.45
1¾ in. o.d. 13 B.W.G.	14.09	12.51	11.89
2 in. o.d. 13 B.W.G.	15.78	14.02	13.31
2¼ in. o.d. 13 B.W.G.	17.60	15.63	14.82
2¼ in. o.d. 12 B.W.G.	19.37	17.21	16.30
2½ in. o.d. 12 B.W.G.	21.22	18.85	17.82
2¾ in. o.d. 12 B.W.G.	22.49	19.98	18.86
3 in. o.d. 12 B.W.G.	23.60	20.97	19.73
3½ in. o.d. 11 B.W.G.	29.79	26.47	24.89
4 in. o.d. 10 B.W.G.	36.96	32.83	30.81
4½ in. o.d. 10 B.W.G.	45.19	40.15	37.86
5 in. o.d. 9 B.W.G.	56.71	50.38	47.57
6 in. o.d. 7 B.W.G.	87.07	77.35	73.25

Extras for less carload quantities:

40,000 lb. or ft. or over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago.	$55.00
6-in. and larger, del'd New York	53.00
*6-in. and larger, Birmingham.	47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	56.00
F.o.b. dock, Seattle	56.00
4-in. f.o.b. dock, San Francisco or Los Angeles	59.00
F.o.b. dock, Seattle	56.00

Class "A" and gas pipe, $3 extra 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $46, Birmingham, and $54 delivered Chicago and 4-in. pipe, $49, Birmingham, and $58 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
½ in. & 6 in. and smaller	.65 and 5*
Larger and longer up to 1 in.	.60 and 10*
1⅛ in. and larger	.60 and 5*
Lag bolts	.60 and 10
Plow bolts, Nos. 1, 2, 3 and 7	.65 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:	
½ in. and smaller	65
9/16 in. to 1 in. inclusive	.60 and 5
1⅛ in. and larger	60

* Less carload lots and less than full container quantity. Less carloads lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon units, U.S.S. and S.A.E.:	
½ in. and smaller	.60 and 10
9/16 in. to 1 in. inclusive	.60 and 5
⅛ in. and larger	60
Stove bolts in packages, nuts attached	70
Stove bolts in packages, with nuts separate	.70 and 10
Stove bolts in bulk	80

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$3.60
F.o.b. Chicago or Birmingham	3.70

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	.65 and 5
F.o.b. Cleveland	.65 and 5
F.o.b. Chicago and Birmingham	.65 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	.50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	.70 and 5
Upset set screws, cup and oval points	.80 and 5
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	3.00c.
Delivered, Detroit	3.15c.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
200 (½% Nickel)	$0.35
2100 (1½% Nickel)	0.75
2300 (3½ Nickel)	1.55
2500 (5% nickel)	$2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel-molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, vents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	£20 Nominal
Tin plate, per base box	20s. 3d. to 21s. 6d.
Steel bars, open hearth	£11
Beams, open-hearth	£10 12s. 6d.
Channels, open-hearth	£10 17s. 6d.
Angles, open-hearth	£10 12s. 6d.
Black sheets, No. 24 gage	£13
Galvanized sheets, No. 24 gage	£16 15s.

CONTINENTAL

Per Gross Ton, Gold £.
f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate ¼ in. and up	£6 7s.
Plate 3/16 in. and 5 mm.	£6 13s.
Sheet, ⅛ in.	£6 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 15s.

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Base per Lb.
Plates	3.70c.
Structural shapes	3.70c.
Soft-steel bars and small shapes	3.80c.
Reinforcing steel bars	2.45c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$4.48
Spikes, large .....1 to 24 kegs	$3.65
	Per Cent Off List
Track bolts, all sizes per 100 count	55
Machine bolts, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb	$4.35
Wire, black, soft ann'l'd, base per 100 lb	$3.30
Wire, galv. soft, base per 100 lb.	$3.70
Common wire nails, per keg	$2.90
Cement coated nails, per keg	$2.90

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

*Delivered in Pittsburgh switching district.

**Prices on application.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	$4.40
Track bolts (keg lots)	5.60
Rivets, structural (keg lots)	**4.95
Rivets, boiler (keg lots)	**5.05
	Per Cent Off List
Machine bolts and carriage bolts, ½ in. and smaller	60
Lag screws	*55 and 5
Hot-pressed nuts, sq. and hex., tap or blank, ½ by 6 in. and smaller	60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72½
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	$3.75 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	$4.55
Com. wire nails, 15 kegs or more, per keg	$3.20
Cement c't'd nails, 15 kegs or more, per keg	$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

* These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

** Base at 100 lb.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	4.02c.
Structural shapes	3.99c.
Soft steel bars, round	4.16c.
Iron bars, Swed. char-coal	7.50 to 8.25c.
Cold-fin. shafting and screw stock:	
Rounds, squares, hexagons	4.61c.
Flats up to 12 in. wide	4.61c.
Cold-rolled; strip, soft and quarter hard	3.81c.
Hoops	4.36c.
Bands	4.36c.
Hot-rolled sheets (10 ga.)	4.00 to 4.11c.
Hot-rolled ann'l'd sheets (24 ga.)	4.50c.
Galvanized sheets (24 ga.)	4.75c.
Long terne sheets (24 ga.)	5.50 to 6.20c.
Armco iron, galv. (24 ga.)	6.25c.
Toncan iron, galv. (24 ga.)	6.25c.
Galvanneal (24 ga.)	6.50c.
Armco iron hot-rolled (10 ga.)	4.60c.
Toncan iron, hot-rolled (10 ga.)	4.60c.
Cold-rolled sheets (20 ga.)	
Standard quality	5.20c.
Deep drawing	5.85c.
Stretcher leveled	5.85c.
SAE, 2300, hot-rolled	7.84c.
SAE, 3100, hot-rolled	6.39c.
SAE, 6100, hot-rolled, annealed	10.54c.
SAE, 2300, cold-rolled	9.04c.
SAE, 3100, cold-rolled, annealed	8.59c.
Floor plate, ⅛ in. and heavier	5.62c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	$3.25
	Per Cent Off List
Machine bolts, square head and nut	60
Carriage bolts, cut thread	60
Nuts, hot pressed and cold punched, all types	55

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	4.02c.
Bars, soft steel (rounds and flats)	4.12c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.27c.
Cold-fin. rounds. shafting, screw stock	4.57c.
Hot-rolled annealed sheets (No. 24)	4.87c.
Galv. sheets (No. 24*)	5.52c.
Hot-rolled sheets (No. 10)	4.12c.
Black corrug. sheets (No. 24*)	4.92c.
2 galv. corrug. sheets	5.57c.
Structural rivets	5.32c.
Boiler rivets	5.42c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	50
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, nuts; all quantities	60

* No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	3.92c.
*Structural shapes	3.92c.
*Soft steel bars, small shapes, iron bars (except bands)	4.03c.
‡Reinforc. steel bars, square and deformed	3.46c.
Cold-finished steel bars	4.56c.
*Steel hoops	4.63c.
*Steel hands, No. 12 and 3/16 in. incl.	4.13c.
*Spring steel	5.50c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	4.90c.
*Hot-rolled annealed sheets (No. 10)	4.03c.
*Diam. pat. floor plates, ¼ in.	5.25c.

These prices are for delivery in Philadelphia trucking area.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

† For 25 bundles or over.

‡ For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.88c.
Soft steel bars	3.75c.
Reinfor. bars (under 2000 lb.)	3.00c.
Cold-fin. bars (1000 lb., over)	4.30c.
Hot-rolled strip, 6 in. wide and under	4.18c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets No. 24 (under 1500 lb.)	4.68c.
Galvanized sheets (No. 24)	5.33c.
Hot-rolled sheets (No. 10)	3.98c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.93c.
Floor plates, 3/16 in. and heavier	5.48c.
*Black ann'l'd wire, per 100 lb.	$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Con. wire nails, base per keg	2.95
	Per Cent Off List
Machine and carriage bolts, small	65 and 5
Large (to and incl. 1 in. diam.)	60 and 10
1⅛ in. and larger	60 and 5
Nuts, 100 count	
½ in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 5 and 5
1⅛ in. and larger	60 and 5

* For 5000 lb. or less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.95c.
Floor plates	5.55c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75c.
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$3.48
Com. wire nails, base per keg:	
Any quantity less than carload	3.20
Cement c't'd nails, base 100-lb. keg.	3.50
Chain, lin. per 100 lb	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$21.80
4-in.	52.45
Lap-welded steel boiler tubes, 2-in.	20.73
4-in.	48.41

BUFFALO

	Base per Lb.
Plates	3.95c.
Floor plates	5.55c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.00c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.82c.
Hot-rolled annealed sheets (No. 24)	4.83c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	4.00c.
Galv. sheet (No. 24)	5.38c.
Bands	4.25c.
Hoops	4.25c.
Heavy hot-rolled sheets	4.00c.
Com. wire nails base per keg	$3.26
Black wire, base per 100 lb. (2500-lb. lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON

	Base per Lb.
Channels, angles	4.26c.
Tees and zees, under 3 in.	4.51c.
H beams and shapes	4.10c.
Plates — Sheared, tank and univ. mill, ¼ thick and heavier	4.11 to 4.61c.
Floor plates, diamond pattern	5.76c.
Bar and bar shapes (mild steel)	4.26c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.46 to 5.46c.
Half rounds, half ovals, ovals and bevels	5.51c.
Tire steel	5.51c.
Cold-rolled strip steel	3.86c.
Cold-finished rounds, squares and hexagons	4.71c.
Cold-finished flats	4.71c.
Blue annealed sheets, No. 10 ga.	4.21c.
One pass cold-rolled sheets No. 24 ga.	5.16c.
Galvanized steel sheets, No. 24 ga.	5.15c.
Lead coated sheets, No. 24 ga.	6.61c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.94c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.55c.
Hot-rolled annealed sheets (No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)**	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 1999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

* Under 400 lb., .50c. over base, 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

** In Detroit only, 1500 to 3749 lb., base less 0.25c.; 3750 to 7499 lb., base less 0.40c.; 7500 lb. and over, base less 0.60c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.88c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.98c.
Soft steel bars, squares and hexagons	4.13c.
Hot-rolled strip	4.23c.
Hot-rolled annealed sheets (No. 24)	4.73c.
Galvanized sheets (No. 24)	5.38c.
Cold-finished steel bars	4.43c.
Structural rivets (keg lots)	5.18c.
Boiler rivets, cone head (keg lots)	5.28c.
Track spikes (keg lots)	4.63c.
Track bolts (keg lots)	5.83c.
Black annealed wire (No. 6 to No. 9 incl.)	3.85c.
Com. wire nails and cement coated nails 100 to 4999 lb.	3.30c.

	Per Cent Off List
Machine bolts and carriage bolts, ½x6 and smaller or shorter	65
Larger and longer up to 1 in., diam.	60–5
1⅛ in. and larger	60
Coach and lag screws	60–5
Hot-pressed nuts, sq. and hex. tapped or blank, 1–199 lb.	50
200 lb. and over:	
½ in. and smaller	62½
9/16 to 1 in.	60
1⅛ in. and over	50–10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.83c.
Hot-rolled annealed sheets, No. 24	4.75c.
Galvanized sheets, No. 24	5.00c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BIRMINGHAM

Bars and bar shapes	$3.85	base
Structural shapes and plates	3.75	"
Hot rolled sheets No. 10 ga.	3.80	"
Hot rolled sheets No. 24 ga.	4.40	" 3500 lb. and over
Galvanized sheets No. 24 ga.	5.05	" 3500 lb. or more
Strip	4.05	"
Reinforcing bars	3.85	"
Floor plates	5.96	"
Cold finished bars	4.91	"
Machine and carriage bolts	50 & 10 off list	
Rivets (structural)	$4.60 base	

On plates, shapes, bars, hot-rolled strip, heavy hot-rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.

BALTIMORE

	Base per Lb.
Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons	3.04c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates ¼ in. and heavier	5.50c.
Galvanized sheets, No. 24, 100 bdls. or more	$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 1999 lb.

All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

Quantity differentials on the basis of combined weight of hot rolled products ordered in one day: Under 100 lb., add $1; 100 to 399 lb., add 50c.; 400 to 1999 lb., base; 2000 to 9999 lb., deduct 20c.; 10,000 to 39,999 lb., deduct 30c.; 40,000 lb. and over, deduct 40c.

CHATTANOOGA

	Base per Lb.
Mild steel bars	4.25c.
Iron bars	4.25c.
Reinforcing bars	4.25c.
Reinforcing shapes	4.15c.
Plates	4.15c.
Hot-rolled sheets No. 10	4.20c.
Hot-rolled annealed sheets, No. 24*	4.10c.
Galvanized sheets No. 24*	4.70c.
Steel bands	4.45c.
Cold-finished bars	4.93c.

* Plus mill item extra.

MEMPHIS

	Base per Lb.
Mild steel bars	4.35c.
Shapes, bar size	4.35c.
Iron bars	4.35c.
Structural shapes	4.25c.
Plates	4.25c.
Hot-rolled sheets, No. 10	4.30c.
Hot-rolled annealed sheets, No. 24	4.95c.
Galvanized sheets, No. 24	5.70c.
Steel bands	4.60c.
Cold-drawn rounds	4.86c.
Cold-drawn flats, squares, hexagons	6.86c.
Structural rivets	5.25c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	55

NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	$3.55
Bolts and nuts, per cent off list	60

PACIFIC COAST

	Base per Lb. San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.975c.	2.975c.	2.975c.
Hot - rolled annealed sheets (No. 24)	5.15c.	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.25c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.45c.	5.90c.
Cold-finished steel Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	$3.40	$3.20	$3.40

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
Super-duty brick, at St. Louis	$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	42.75
Second quality, New Jersey	49.00
No. 1, Ohio	39.90
Ground fire clay, per ton	7.10

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$47.50
Chicago District	56.05
Birmingham	47.50
Silica cement per net ton (Eastern)	8.55

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00

Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester	$67.00
Chemically bonded, f.o.b. Baltimore	57.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.50
Delivered Newark or Jersey City	26.53
Delivered Philadelphia	25.84
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
Delivered Cincinnati	24.44
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered, San Francisco, Los Angeles or Seattle	26.95
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	$25.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.61
Delivered Canton, Ohio	24.89
Delivered Mansfield, Ohio	25.44
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.53
Delivered Philadelphia	26.84
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	24.50
F.o.b. Birmingham	25.00
Delivered Cincinnati	25.61
Delivered Canton, Ohio	25.89
Delivered Mansfield, Ohio	26.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$28.50

Gray Forge

Valley or Pittsburgh furnace	$23.50

Charcoal

Lake Superior furnace	$27.00
Delivered Chicago	30.34

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$102.50

Spiegeleisen

Per Gross Ton Furnace

Domestic 19 to 21%	$33.00
F.o.b. New Orleans	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50%	$33.50

For each additional 0.50% silicon up to 17%, 50c. per ton is added.

Manganese 2 to 3%, $1 per ton additional. For each unit of manganese over 3%, $1 per ton additional. Phosphorus 0.75% or over, $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	$27.50

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	$101.50*
2.50% carbon	106.50*
2% carbon	111.50*
1% carbon	121.50*

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally	$2.00
Ferrotungsten, lots of 500 lbs. nominally	2.05
Ferrotungsten, smaller lots, nominally	2.10
Ferrovanadium, contract, per lb. contained V., delivered	$2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots.	$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville	$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.

*Spot prices are $5 per ton higher
†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Messabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68½% iron. Nominally 17 to 18c.	
Iron, basic or foundry, Swedish, aver. 65% iron. Nominally 15c.	
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	40c.
Man., African, Indian, 44-48%	40c.
Man., African, Indian, 49-51%	Nominally 38c.
Man., Brazilian, 46 to 48½%	Nominally 38c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	$19.00
Tungsten, domestic, scheelite delivered	$18.00 to 20.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	15.00
Rhodesian, 45%	21.00
Rhodesian, 48%	24.50
Turkish, 48-49%	24.00 to 25.00
Turkish, 45-46%	22.50 to 23.00
Turkish, 44%	18.00 to 18.50
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	24.50 to 25.50
48-49%	24.50 to 25.00

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$18.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines	$18.00 to 19.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore, No. 3 distillate	4.75c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	4.75c.
Del'd Ch'go, No. 3 industrial	4.15c.
Del'd Ch'go, No. 5 industrial	4.00c.
Del'd Cleve'd, No. 3 distillate	5.50c.
Del'd Cleve'd, No. 4 industrial	5.25c.
Del'd Cleve'd, No. 5 industrial	3.25c.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$3.75
Foundry, f.o.b. Connellsville, Prompt	$4.75 to 5.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	11.05
Foundry, by-product, delivered Cincinnati	10.50
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75

..CAST IRON PIPE..

South Miami, Fla., plans pipe lines for water system; also elevated steel tank and tower, pumping machinery, water-softening plant and other waterworks installation. Cost about $100,000. Financing is being arranged through Federal aid. William Sydow, 3461 Main Highway, Miami, Fla., is consulting engineer.

Quenemo, Kan., plans 2250 ft. of 6-in., 10,300 ft. of 4-in., and 7560 ft. of 2-in. for water system; also about seven tons of fittings, 60,000-gal. tank and other equipment. Special election has been called July 1 to approve bond issue for work. Engineering Service Co., Railway Exchange Building, Kansas City, Mo., is consulting engineer.

Roanoke, Va., plans 6, 8 and 12-in. pipe for extensions in water system in several streets and replacements of certain existing 6-in. lines with larger pipe; also installation of elevated steel tank and tower in Grandin Court-Weaver Heights district. Cost about $165,000. Financing is being arranged through Federal aid. Charles E. Moore is manager of water department.

Huntington Water Co., Huntington, W. Va., has authorized installation of 8300 ft. of 8-in. and 778 ft. of 12-in. for extensions in system to Harveytown. Contract for labor has been let to Bishop & Robinson Co., Huntington; pipe and fittings will be furnished by company. Cost about $40,000.

Kaycee, Wyo., plans water pipe lines and other waterworks installation. Cost about $25,000. Financing is being arranged through Federal aid. Daniel J. McQuaid, Cooper Building, Denver, is consulting engineer.

Burlington, Wis., closes bids June 25 for about 3100 ft. of 4, 6 and 8-in. pipe; also for fittings, gate valves, valve boxes, etc. Lester O. Hoganson is city engineer.

Appleton City, Mo., plans about two miles of 8-in. pipe and other water system extensions and improvements, including new purification plant. Cost about $81,000. Financing is being arranged through Federal aid. J. W. Shikles & Co., New York Life Building, Kansas City, Mo., are consulting engineers.

Blue Ridge, Tex., plans water pipe lines and other waterworks installation. Cost about $34,000. Joseph J. Rady, Majestic Building, Fort Worth, Tex., is consulting engineer.

Amarillo, Tex., plans pipe line extensions and replacements in water system, including new elevated steel tank and tower, pumping machinery and other waterworks installation. Fund of about $200,000 will be arranged through Federal aid for this and improvements in sewerage system.

Archdale, N. C., plans pipe lines for water system and other waterworks installation. Project will be carried out by Archdale-Trinity Sanitary District, which has called special election July 23 to vote bonds for $95,000 for this and sewerage system.

Cutler, Ill., plans water pipe lines and other waterworks installation, including elevated steel tank and tower. Cost over $25,000. G. B. Davis, Chester, Ill., is consulting engineer.

Cuyahoga Falls, Ohio, has awarded 555 tons of cast-iron water pipe to J. B. Clow & Sons, Cleveland.

Structural Welding Progress In Germany

(CONTINUED FROM PAGE 36)

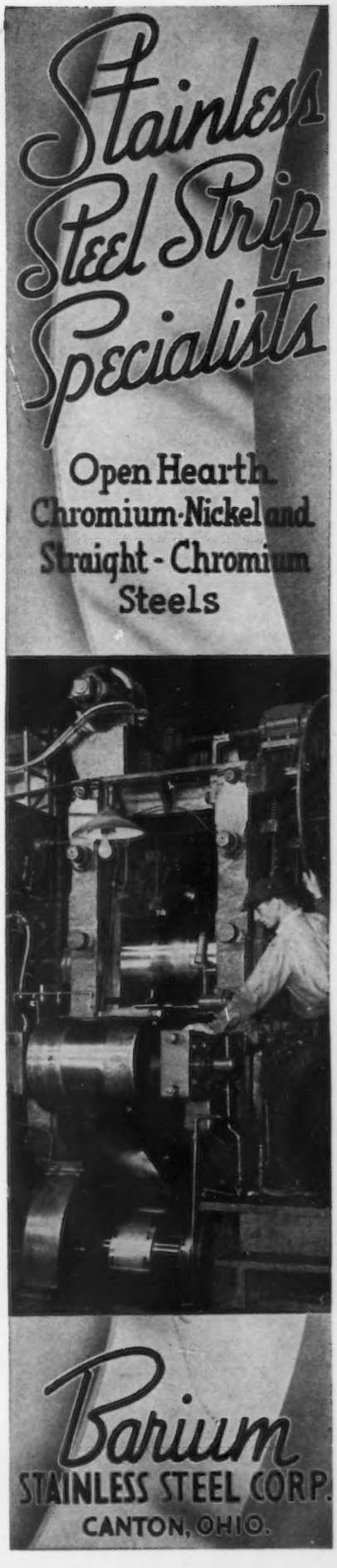
frames have a maximum span of 70 ft. and only two vertical stiffeners have been used over the whole span of the plate girder. Only a small strip of the vertical columns is to be seen inside the station, the other portion being outside so as to avoid obstruction with the railroad track. The station itself is carried on bridges transmitting the horizontal thrust of the two-hinged frames to their abutments.

The above illustrations indicate that modern welded buildings in Germany are generally of simple and square appearance. While most of the foregoing examples were taken from buildings for railway purposes a similar development may also be found with buildings for many other purposes, especially factory and office buildings. A four-story factory building erected at Finsterwalde for the Kjellberg Electrodes Company consists of two-hinged frames of 48-ft. span, each put on top of the frame below. Fig. 7 is an interior view. Both columns and beams consist of plate girders 24-in. deep, the flanges being 10 in. x ½ in. Each frame is 11 ft. 6 in. high, the total height of the building above floor level being 47 ft. It will be noticed that apart from the slight pitch in the girders only vertical and horizontal members are used for the building up of the frames, and only a simple corner joint under 45 deg. affords the necessary reinforcement in the corners. An effective steel structure has thus been achieved, part of which is shown in the perspective view, Fig. 8.

As a rule welded buildings do not attract as much attention as welded bridges do. The main reason being that when the job is finished the steel structure itself is nearly always covered in by masonry and glass so that very little if any part of the steel work remains uncovered. The fact remains, however, that the welding of buildings in Germany has become well established and that buildings of the rigid-frame type have been developed to a high standard of efficiency. Owing to the present lack of raw materials the saving in weight plays a still more important part than before in favor of the welded design.

Irvin President of Pennsylvania Society

WILLIAM A. IRVIN, vice-chairman of the board of United States Steel Corp., this week was elected president of the Pennsylvania Society of New York. Other steel men who have headed the society, which includes many native Pennsylvanians living in the New York area, are Charles M. Schwab and Andrew Carnegie. Mr. Irvin was born in Indiana, Pa., in 1873, and from 1932 to 1938 was president of U. S. Steel.



THIS WEEK'S MACHINE . . .TOOL ACTIVITIES. . .

. . . Sales rebound at Cincinnati from previous week's low, but in most districts sales are dragging . . . Chief prospects the arsenals and navy yards.

Sales Rebound From Previous Week's Low

CINCINNATI—Machinery demand rebounded last week from the former week's low, bringing the market level to about 25 per cent of capacity. Just as they led in the down curve, lathes were largely responsible for the better showing the past week. The fact that the bulk of this lathe ordering was from domestic sources, together with a slight improvement of domestic interest in other tools, contributed a small, but discernible bright spot to the otherwise drab market. Of course, this may be a passing feature, but any straw is being seized to test wind direction in the present situation. Orders are still for one or two units and foreign business still reflects continental European desire to re-equip. One builder of low priced automobiles was listed among purchasers the past week, but quantity and type were undisclosed.

Outlook Discouraging to Mid-West Dealers

CHICAGO—Most machine tool sellers in this district are regarding the future pessimistically as hardly a single encouraging prospect for new business is known at the present time. Some offices last week reported no orders had been received for a week and longer. Small tool buying is being maintained at about the same rate as last month, however, which augurs well for the machine tool outlook later in the summer. Local buying is extremely spotty and no lists are being issued, with some lists brought out several months ago as yet not completely bought. The Link-Belt Co. is expanding its Indianapolis plant, but necessary tool purchases probably will be made in that territory.

Small Presses Selling Fairly Well in Ohio

CLEVELAND — Conditions remain mixed, with scattered orders for small items preponderant, inquiries a little more active and optimism improved among producers and sellers. Manufacturers of presses and kindred equipment report better inquiries, not for large projects, but widely diversified. Small presses have been moving well, supplemented by can machinery and mill equipment. The building trades and electrical supply fields appear a little more active.

Although tool rooms are becoming busier on 1939 programs, there has been very little automotive buying of machine tools during the past 45 days.

Metropolitan Tool Market Depends on Government and Aircraft

NEW YORK—Buying in the past week has been confined almost entirely to arsenals and Navy yards, and practically the only new business in sight for the machine tool trade is from these sources—those and firms favored with Army and Navy contracts, including various branches of the aircraft industry. One of the busiest concerns in the East is Wright Aeronautical Corp., for example, which has been acquiring new machine tools steadily all winter and spring. The Curtiss Propeller Division of Curtiss-Wright Corp., another subsidiary, is being moved from Buffalo to Clifton, N. J., a few miles from the engine plant in Paterson. Whether any new machinery is involved is problematical, since the propeller division within the past month bought rather heavily and for quick delivery to take care of some new foreign contracts. Meanwhile, interest on the part of general industrial concerns is practically nil, lending considerable discouragement to local sellers.

Lethargy in Tool Sales Continues in Detroit

DETROIT—Die shops in the auto area are fairly active, with cleanup scheduled in time for August try-outs in most cases, since new car production will be under way by early fall. Continued lethargy marks the greater part of the machine tool business, although developments in new surface finishing methods at Chrysler has aroused some interest in equipment for this kind of work. Ford of Canada has bought cylinder bore gaging equipment and apparently is a moderately live spot at present for machinery suppliers.

. . .OBITUARY. . .

EDWIN ELMER RUSSELL, vice-president in charge of purchasing of the J. I. Case Co., died suddenly June 6 at a Racine, Wis., hospital, following an operation. Mr. Russell, who was 69 years old, was born in Kidder, Mo., and entered the employ of the Case company in 1889, in the general offices, later being transferred to sales and collection work. He served later as branch manager in Nashville, Tenn., assistant general sales manager at Racine, head of the European activities of the organization with headquarters at Paris and Odessa, Russia, and general foreign sales manager at Racine. In 1915 he assumed charge of purchases and in 1919 became vice-president in charge of purchases. Mr. Russell was a 32nd degree Mason and a member of the Somerset Club of Racine.

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GEORGE R. BOYCE, vice-president and director, A. M. Castle & Co., Chicago, died last week in a Chicago hospital after an illness of nearly a year, caused by an automobile accident. Mr. Boyce became associated with the company in 1912 and specialized in railroad sales.

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JOHN ALEXANDER WILSON, president of Wilson-Brown, Inc., machine tool dealer organization in New York, died at his home at Plainfield, N. J., on June 13 at the age of 56. He had been in ill health for some time, though actively connected with Wilson-Brown from the time of its incorporation in 1924.

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FRANKLIN ATWOOD PARK, vice-president and chairman of the board of the Singer Mfg. Co., died on June 17, at his summer estate at Penzance Point, Woods Hole, Mass. Mr. Park was born in Taunton, Mass., Jan. 22, 1868; was graduated from Massachusets Institute of Technology in 1895; joined the Singer Mfg. Co. in 1901 at its South Bend, Ind., plant, became manager of the company's Clydebank, Scotland, plant in 1904, remained there until 1912 when he was made vice-president of the concern.

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BENJAMIN F. CURTIS, for 50 years traffic manager of the Norton Co., Worcester, Mass., died suddenly on June 10, aged 69 years. He retired in 1937. He was an ex-president and a charter member of the New England Traffic Men's Association.

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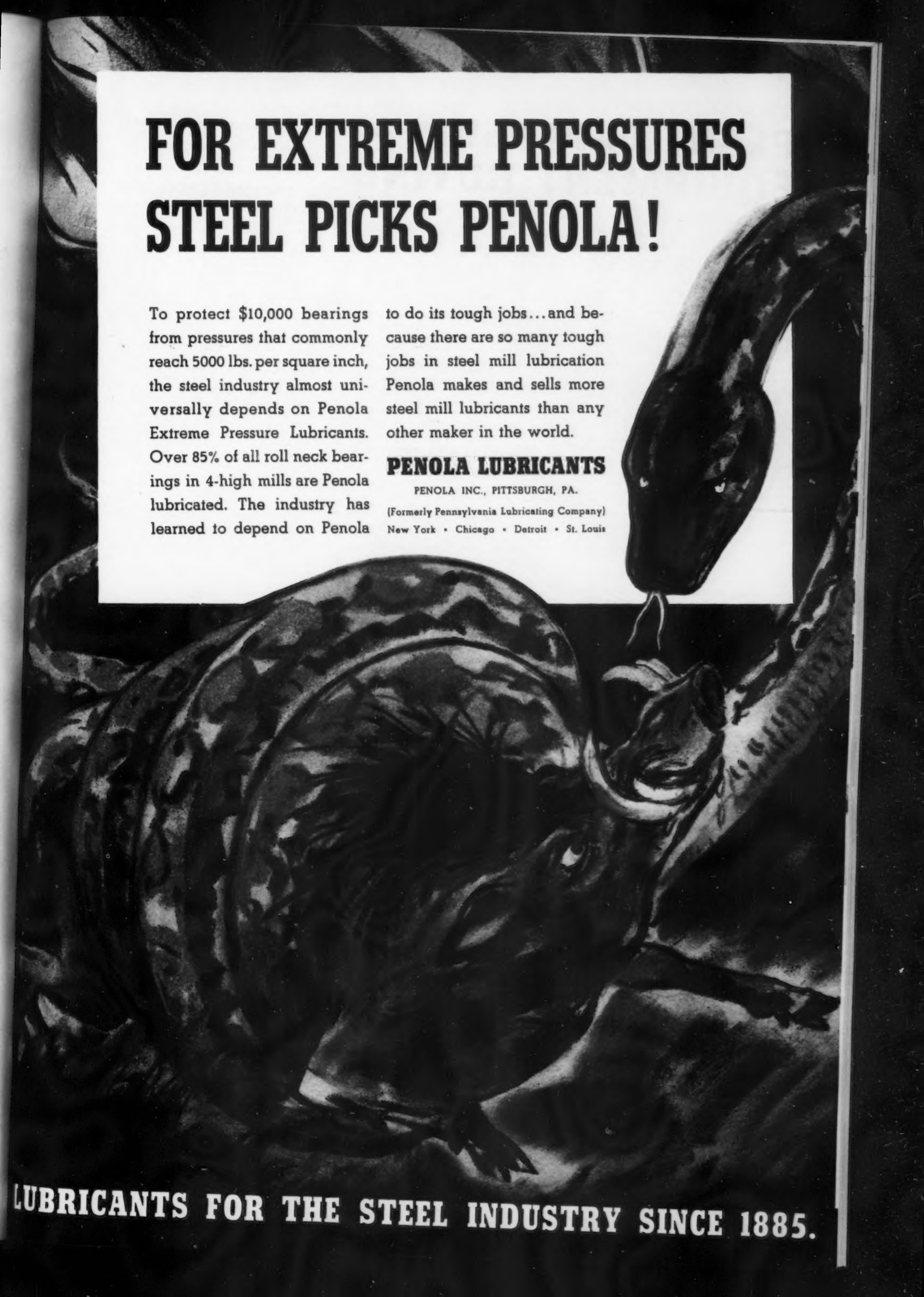
FRANK S. MCCULLOUGH, electrical engineer and head of the testing department at Electroller & Mfg. Co., Cleveland, died June 14 following a heart attack. He had been associated with the company for 25 years.



FOR EXTREME PRESSURES STEEL PICKS PENOLA!

To protect $10,000 bearings from pressures that commonly reach 5000 lbs. per square inch, the steel industry almost universally depends on Penola Extreme Pressure Lubricants. Over 85% of all roll neck bearings in 4-high mills are Penola lubricated. The industry has learned to depend on Penola to do its tough jobs... and because there are so many tough jobs in steel mill lubrication Penola makes and sells more steel mill lubricants than any other maker in the world.

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PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, has acquired a large tract at Mobile, Ala., for new branch plant for production of industrial chemicals. Work on initial unit for manufacture of sulphate of alumina, will begin soon. Cost over $500,000 with equipment.

Commanding Officer, Ordnance Department, Watervliet Arsenal, Watervliet, N. Y., asks bids until July 5 for three or four milling machines (Circular 112), one or two automatic reproducing machines (Circular 115).

Norwood Steel & Iron Works, Bronx, New York, recently organized, has leased one-story building, 50 x 100 ft., at 615 Tiffany Street for plant.

New York Central Railroad Co., 466 Lexington Avenue, New York, has let general contract to Duffy Construction Corp., 230 Park Avenue, for extensions and improvements in maintenance-of-way repair shop and storehouse, 506 West Thirtieth Street. Cost over $50,000 with equipment. J. W. Pfau, first noted address, is chief engineer.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for replacements and repairs in automatic combustion control systems for two boiler units in power house at naval hospital, Brooklyn (Specifications 8738).

Department of Water Supply, Gas and Electricity, Municipal Building, New York, has filed plans for new one-story gate house, 97 x 124 ft., at Goulden and Sedgwick Avenues, Bronx. Cost close to $100,000 with equipment.

Standard Oil Co. of New Jersey, 30 Rockefeller Plaza, New York, will expend about $150,000,000 for expansion, modernization and improvements in plants and properties during present year, including oil and gasoline refineries, bulk oil terminals, pipe lines, tankers, Oil drilling and production facilities.

Curtiss-Wright Corp., 30 Rockefeller Plaza, New York, airplanes, engines, parts, etc., has leased, with option to purchase, former plant of Portable Machinery Co., Lakeview Avenue, Clifton, N. J., consisting of a main one-story unit, 100 x 480 ft., and smaller structure, 40 x 240 ft., for propeller-manufacturing division, now located at Buffalo. Improvements will be made in buildings and Buffalo works moved to new location during summer. Clifton plant will be operated in conjunction with Wright Aeronautical Corp., Paterson, N. J., a unit of first noted company, devoted to aircraft engine production. W. K. Swigert, manager of production, will be in charge.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until June 27 for gages, including plain plug, adjustable snap, thread ring, twin ring, flush pin, etc. (Circular 1057); until June 28 for ⅝-in. flat, nailless steel strapping (Circular 1060), flush pin, plain plug and profile gages (Circular 1173).

Italian Swiss Colony Wines, 333 Sixth Avenue, New York, operated by Gambarelli & Davitto, have leased about 10,000 sq. ft. additional in Lackawanna Terminal Warehouses, 629 Grove Street, Jersey City, N. J., for expansion in bottling, storage and distributing plant.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until June 27 for one or two tracer bullet charging machines, caliber 0.50, one to four horizontal toggle and crank presses for pocketing and heading, caliber 0.50, six to 13 machines for charging tracer bullets, caliber 0.30 (Circular 1097); until June 28, three toolmakers' knees, three universal squares, three cylindrical squares, three surface plates, parallels, bench cutters, etc. (Circular 1139), two automatic screw machines, bullet jacket trim, caliber 0.50, one or two automatic screw machines, case head turn, caliber 0.50 bullet (Circular 1099); until June 29, gages, plain plugs, flush pins, thread plugs, thread rings, etc. (Circular 1147 and 1157), three bench type comparator gages (Circular 1163), precision gage blocks, precision lathe, straight edges, etc. (Circular 1156); until June 30, five precision-type motor-driven bench lathes, and one motor-driven precision-type bench milling machine (Schedule 1104).

Wilmington School Building Corp., Administration Building, Eleventh and Washington Streets, Wilmington, Del., John J. Murray, business manager, asks bids until June 28 for supplies for new vocational high school now in course of erection, including machine shop, auto mechanics shops, foundry, general metal and plumbing shop, woodworking and other shop units.

BUFFALO DISTRICT

Curtiss Aeroplane Division, Curtiss-Wright Corp., Vulcan Street and Kenmore Avenue, Buffalo, has let general contract to Darin & Armstrong, Inc., 2041 Fenkell Avenue, Detroit, for two one-story additions, 100 x 360 ft., and 48 x 300 ft., for extensions in manufacturing division and for engineering department, in order noted. Cost over $175,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Electric City Paper Mills, Inc., 25 Adams Street, Niagara Falls, N. Y., manufacturer of roofing papers, etc., has let contract to August Feine & Sons Co., 140 Terrace Street, Buffalo, for structural steel for one-story mill, to replace plant unit recently destroyed by fire. Cost about $50,000 with equipment.

NEW ENGLAND

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until July 1 for two 4000-lb. electric hoists for Boston Navy Yard (Schedule 3774).

School Board, New Britain, Conn., plans three-story addition to trade school. Cost about $290,000. Financing will be arranged through Federal aid. Warren S. Holmes, Hartford, Conn., is architect.

Commanding Officer, Ordnance Department, Watertown Arsenal, Watertown, Mass., asks bids until July 4 for one 1200-kw. motor-generator set (Circular 117).

Whitney Blake Co., Dixwell Avenue, Hamden, Conn., manufacturer of insulated wire and cable, has plans for one-story addition, 125 x 180 ft. Cost over $70,000 with equipment. Leo F. Caproni, 1221 Chapel Street, New Haven, Conn., is architect.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until July 6 for seven semi-automatic, multi-tool gun-barrel turning lathes (Circular 288), one broach sharpening machine (Circular 289).

SOUTH ATLANTIC

Pepsi-Cola Co., Fayetteville, N. C., R. B. Minges, head, has let general contract to Dixon Construction Co., Fayetteville, for one-story mechanical-bottling plant. Cost close to $50,000 with equipment. Robert L. Clemmer, Hickory, N. C., is architect.

J. A. Beavers & Associates, Newnan, Ga., operating Beavers Meat Curing Co., Greenville Street Extension, have let general contract to Roger, Pate & Co., Newnah, for one-story meat packing plant, 40 x 100 ft. Cost close to $55,000 with equipment. David S. Cutting, Title Building, Atlanta, Ga., is architect.

City Council, Homestead, Fla., plans extensions and improvements in municipal electric light and power plant, including new 700-kw. diesel engine-generating unit and auxiliary equipment. Financing will be arranged through Federal aid. William Sydow, 3461 Main Highway, Miami, Fla., is consulting engineer.

WASHINGTON DIST.

Chief, Bureau of Ordnance, Navy Department, Washington, asks bids until July 5 for 12 14-in./50 liner forgings, six 6-in./53 liner forgings, 50 5-in./51 liner forgings, 50 4-in./50 liner forgings, 18 5-in./25 gun barrel forgings, 142 5-in./38 gun barrel forgings.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until June 27 for rail transport equipment and supplies, including pipe-threading machine, reamers, rivet sets, pipe wrenches, oil and water extractors, etc. (Circular 398-180); until July 1 for fire truck parts and equipment, including axles, springs, gears, tanks, bolts, screws, nails, malleable iron castings, rivets, screwdrivers, brakes, wheels, bumpers, etc. (Circular 398-166).

American Refrigeration Co., Inc., Fifteenth and Cary Streets, Richmond, Va., asks bids until July 1 on general contract for new four-story cold storage and food products freezing plant, with division for frosted food production. Installation will include a 50-ton refrigerating plant, conveyors, loaders and other mechanical-handling equipment. Cost over $500,000 with machinery. Company also plans smaller units of similar character at Alexandria, Front Royal and Petersburg, Va. Otis K. Asberry, 3800 Monument Avenue, is architect; R. T. Lipscomb, Sr., 1425 East Main Street, is engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 28 for 10,170 lb. of nickel-copper alloy air cylinder forgings (Schedule 3748) for Washington yard; until June 28 for controllable pitch aircraft propeller governor units and spare parts (Schedule 3769); until July 1, spare parts for aircraft bank and turn indicators (Schedule 900-1853), main reduction gears (Schedule 3653) for Eastern and Western Navy yards; gasoline and alcohol torches (Schedule 3714) for Brooklyn, Boston, Philadelphia, Mare Island and other yards; until July 5, for 12 motor-generator sets, control and voltage regulator equipment, and spare parts for Portsmouth Navy Yard, one motor-generator set and spare parts for Mare Island yard (Schedule 3772).

SOUTH CENTRAL

J. Aron & Co., 416 Poydras Street, New Orleans, have let contract to Mosher Steel Co., 5101 Maple Street, Dallas, Tex., for structural steel for rebuilding Supreme Sugar Refinery, near Labadie, La., destroyed by fire several weeks ago. New plant will include power house, machine shop and other mechanical departments. Cost close to $500,000 with machinery. Leo S. Weil and Walter B. Moses, 427 South Peters Street, New Orleans, are consulting engineers.

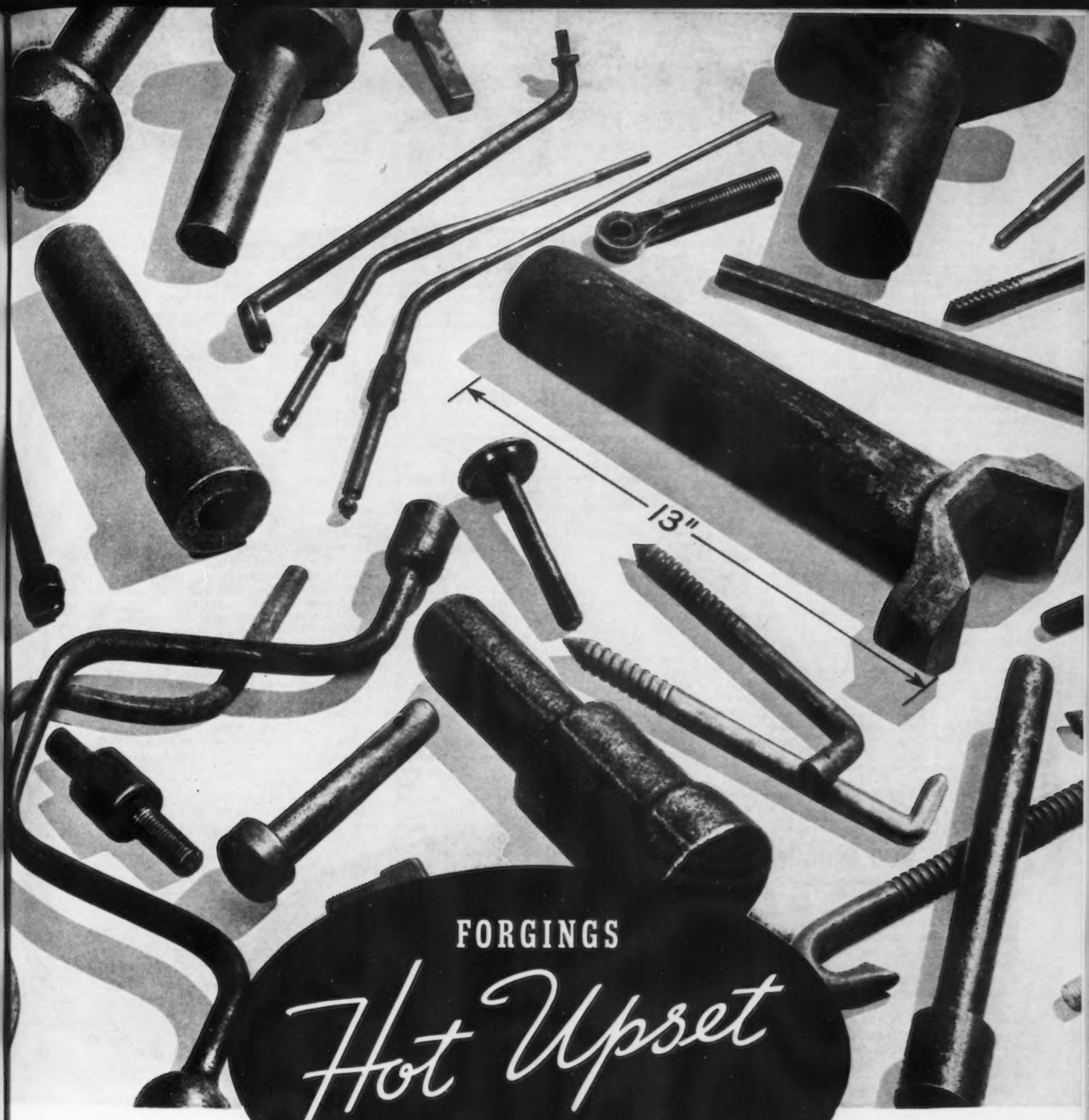
Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until June 29 for three 30,000-kva. vertical shaft a.c. electric generators for hydroelectric power plant at Chickamauga Dam, Tenn.

Tri-County Electric Membership Corp., Lafayette, Tenn., operating a rural electric system, plans new hydroelectric generating plant on Barren River, near Jews Harp Bend, Allen County, Ky., comprising power dam 110 ft. high and 1500 ft. long, power plant, power substations and switching stations, transmission lines, etc. Cost over $3,000,000. Financing will be arranged through Federal aid. Daniel T. Duncan, Ninety-Six (Greenwood County), N. C., is consulting engineer.

United States Engineer Office, First District, New Orleans, asks bids until July 8 for one 5-ton gas engine crawler-type crane (Circular 325).

SOUTHWEST

Meyer Kornblum Packing Co., 300 Central Avenue, Kansas City, Kan., meat packer, will take bids soon on general contract for



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BOLT-MAKING machinery is called upon frequently to do the unusual in *hot forging* as well as in *cold forging*. Above are shown some typical examples of hot forged work produced in our plants. Our engineers co-operate with your engineers in analyzing your *needs*—and then if it is practical to produce the part economically for you—we will tell you what can be done and what it will cost *in production quantities*. We have made hot forged parts such as those illustrated from the full range of carbon and alloy steels, stainless steels and special steels; brasses, bronzes and copper—in fact of all materials which lend themselves to upset forging. All the experience and skill accumulated in more than 70 years of bolt manufacture is at your disposal whenever our engineers are called upon for help, and the facilities of our five plants assure you of our capacity to produce and deliver on schedule. Send blueprints and samples for cost estimates and specify probable quantities and rate of delivery required. THE LAMSON & SESSIONS COMPANY, General Offices, Cleveland, Ohio. *Five Plants at* Cleveland and Kent, Ohio; Chicago and Birmingham.

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LAMSON & SESSIONS

two-story addition, 40 x 120 ft. Cost over $50,000 with equipment. Carl Schloemann, 6329 San Bonita Avenue, Clayton, Mo., is architect.

Steel Sales Corp., 4067 Park Street, St. Louis, has let contract to L. O. Stocker Co., Arcade Building, for one-story storage and distributing plant, 100 x 340 ft., at McRee and Vandeventer Avenues. Cost about $125,000 with equipment, to include two 10-ton electric traveling cranes, hoists and other mechanical-handling equipment. An air-conditioning system will be installed. H. A. Durr & Co., 123 West Madison Street, Chicago, are consulting engineers. Main offices of company are at Chicago.

Hires Bottling Co., Joplin, Mo., has asked bids on general contract for two-story bottling, storage and distributing plant, 80 x 100 ft. Cost over $50,000 with equipment. Besecke, Swanson & Terney, Reliance Building, Kansas City, Mo., are architects.

Board of Education, Library Building, Kansas City, Mo., plans two, three and four-story and basement addition to manual training high school at Fifteenth Street and Forest Avenue. Cost about $300,000. A bond issue will be voted at August primary election. Charles A. Smith is architect and Nate W. Downes, mechanical engineer, both Finance Building.

Commanding Officer, Ordnance Department, San Antonio Arsenal, San Antonio, Tex., asks bids until June 27 for three motor-driven drill presses (Circular 31).

Continental Supply Co., Continental Building, Dallas, Tex., gas and oil well machinery and supplies, has approved plans for one and two-story factory branch, storage and distributing plant on part of 10-acre tract on Buffalo Bayou and Houston ship channel, Houston, Tex., recently acquired. Dock will be built on waterfront, with unloading, conveying and other mechanical-handling equipment. A traveling crane will be installed in plant. Cost close to $200,000. Harry E. Weaver, Esperson Building, Houston, is architect. Company is a subsidiary of Youngstown Sheet & Tube Co., Youngstown, Ohio, which will ship steel pipe by barge from plant to new destination.

OHIO AND INDIANA

Great Lakes Coca-Cola Bottling Co., 1235 Summit Street, Toledo, Ohio, has let general contract to A. Bentley & Sons Co., 201 Belmont Street, for one and two-story and basement mechanical-bottling plant, 150 x 160 ft., on Sylvania Avenue. Cost over $100,000 with equipment. Hewlett & Best, Richardson Building, are architects.

Board of Trustees of Public Affairs, Tippecanoe City, Ohio, will take bids soon for pumping machinery, feedwater heaters and accessories, 5-ton crane and other equipment for municipal electric power plant. Walter I. Barrows, Reibold Building, Dayton, Ohio, is consulting engineer.

Kirk Grocery Co., Vine Street, Columbus, Ohio, will ask bids soon on general contract for two-story addition to bulk storage and distributing plant, 47 x 160 ft. Cost close to $50,000 with machanical-handling and other equipment. J. Edgar Outcalt, 232 North High Street, is architect.

Board of Public Works, City Hall, Indianapolis, has asked bids on general contract for new hangar and one-story mechanical shop adjoining. Cost close to $70,000 with equipment. Benjamin Bacon, 605 White River Parkway South, is architect.

Town Council, Bargersville, Ind., will take bids soon for one 75,000-gal. elevated steel tank and tower, deep-well pumping machinery and accessories, and other equipment for municipal waterworks. John W. Moore & Son, Indiana Pythian Building, Indianapolis, are consulting engineers.

MICHIGAN DISTRICT

Board of Water and Electric Light Commissioners, Lansing, Mich., has let contract for superstructure for addition to municipal electric power and steam plant, equivalent to a six-story building, to S. E. Pentecost Construction Co., 5151 Maybury Street, Detroit. Entire project will cost $2,750,000 with generators, boilers and other station equipment. Claude Erickson, Lansing, is engineer; Bowd & Munson, Lansing, are associate engineers.

Board of Education, Adrian, Mich., plans installation of an industrial art and manual training department in two-story addition to school. Cost about $225,000. Financing is being arranged through Federal aid. Warren S. Holmes Co., Lansing, Mich., is architect.

Gamble-Skogmo, Inc., Minneapolis, Minn., chain store grocer, has leased former motor truck plant of Triangle Truck Co., St. Johns, Mich., and will improve for new bulk storage and distributing plant to serve over 100 stores in that area, including loading, conveying and other mechanical-handling facilities.

MIDDLE WEST

Pioneer Brewing Co., Summit Street, Joliet, Ill., has approved plans for one-story mechanical-bottling unit. Cost close to $40,000 with equipment.

Pfaelzer Brothers, 911 West Thirty-seventh Place, Chicago, meat packers, have awarded general contract to All Building Construction Co., 179 West Washington Street, for two-story and basement addition. Cost about $50,000 with equipment. I. S. Stern, 306 South Wabash Avenue, is architect.

District Quartermaster, Omaha, Neb., asks bids until June 27 for prefabricated demountable buildings, various deliveries (Circular 5701-118).

City Council, Alliance, Neb., plans addition to municipal electric power plant, and installation of new turbo-generator unit, boiler, pumps and auxiliary equipment. Cost about $330,000. Financing will be arranged through Federal aid. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

Rath Packing Co., Sycamore and Elm Streets, Waterloo, Iowa, meat packer, has asked bids on general contract for four-story and basement addition, 62 x 242 ft. Cost over $100,000 with equipment. John S. Bartley is company architect at plant.

Common Council, Janesville, Minn., plans call for bids soon for new municipal electric power plant. Cost about $100,000 with generating unit and auxiliary equipment. Bond issue has been arranged. G. M. Orr & Co., Baker Building, Minneapolis, Minn., are consulting engineers.

Purchasing Agent, Bureau of Reclamation, Denver, asks bids until July 1 for 99,000 lb. of steel reinforcing bars and 1800 sq. ft. of electrically-welded wire fabric (Proposal C-23195-A). Bureau will begin work soon on new power transmission line from Seminoe dam hydroelectric power plant, Wyoming, to Greeley, Colo., by way of Laramie and Cheyenne, Wyo. Cost about $700,000.

District Quartermaster, Sparta CCC District, Sparta, Wis., asks bids until June 27 for oil filters (Circular 7601-145).

PACIFIC COAST

Stauffer Chemical Co., 636 California Street, San Francisco, has asked bids on general contract for one-story grinding unit at 3200 East Twenty-sixth Street, Los Angeles, 50 x 100 ft. Cost close to $45,000 with equipment. W. M. Bostock, 6221 Pacific Boulevard, Huntington Park, Cal., is architect.

Pasadena Refrigerator Mfg. Co., 2948 East Walnut Street, Pasadena, Cal., plans rebuilding part of plant recently destroyed by fire. Loss close to $45,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until July 1 for spare parts for airplanes (Schedules 900-1867 and 900-1859), one motor-driven precision mounted bench lathe (Schedule 3760) for San Diego Naval Air Station; one diesel engine-driven generator unit, with circuit breaker, spare parts, etc. (Schedule 3756) for Puget Sound Navy Yard.

Hood River Apple Growers' Association, Hood River, Ore., has let general contract to Baldwin & Wheir Co., Hood River, for rebuilding part of fruit-packing, storage and distributing plant destroyed by fire a few months ago. Cost close to $100,000 with equipment. W. Q. Bateman is general manager.

War Department, Washington, plans new army air base near Fairbanks, Alaska, for which a fund of $10,000,000 is proposed from army appropriation bill recently passed, to include eight large hangars with repair and reconditioning shops, estimated to cost $2,800,000; shops and technical buildings, runways and drainage, $1,413,000; officers' quarters, barracks, etc., with light, power, heating and water utilities and miscellaneous mechanical buildings and equipment will absorb remainder of fund.

Tacoma Sash & Door Co., Tacoma, Wash., plans rebuilding part of plant on tideflats recently destroyed by fire. Loss close to $100,000 with machinery.

Orange County Bottling Corp., Santa Ana, Cal., care of Frank Lansdown, 514½ Main Street, architect, has let general contract to J. Ogden Markel, 717 Minter Street, for one-story mechanical-bottling plant. Cost close to $40,000 with equipment.

FOREIGN

Svenska Cellulose A-B, Stockholm, Sweden, operating wood pulp mills, has plans for new works at Svartvik, Sweden, for production of cellulose for rayon industry, to include power house, machine shop and other mechanical departments. Cost close to 7,000,000 kroner (about $1,792,000) with equipment.

Air Committee, Chamber of Deputies, Paris, France, is securing appropriation of about 3,500,000,000 fr. ($98,500,000) for purchase of airplanes and machinery for aircraft factories. Of this amount approximately 900,000,000 fr. ($24,300,000) will be used for purchase of machine tools, and other shop and plant equipment. Consideration is being given to making extensive purchases in United States.

Shredded Wheat Co., Niagara Falls, Ont., has let contract to Smith Brothers, local, for a five-story addition, 43 x 180 ft., to cost $150,000.

Columbia Steel Co. Opens New Office Building

LOS ANGELES.—Columbia Steel Co., Pacific Coast subsidiary of United States Steel Corp., officially opened its new Los Angeles office building June 20.

Of modified modern architecture, the building has two floors and a pent house with 17,089 sq. ft. of office space. It is steel framed with concrete walls poured to contribute to the architectural design.

Portions of the interior have been trimmed with stainless steel to illustrate to customers and visitors the numerous possibilities of the use of steel in construction and decoration. A large mural in the reception foyer depicts the manufacture and uses of steel.

A combined heating and air conditioning system operates on a zone control basis, allowing different portions of the building to maintain atmospheric conditions within the comfort zone.

PRODUCTS INDEX

CLEANERS—Metal
American Chemical Paint Co., Ambler, Pa.
Ford, J. B., Co., The, Wyandotte, Mich.
Pennsylvania Salt Mfg. Co., Phila., Pa.

CLEANING COMPOUNDS—Alkali
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CLEANING EQUIPMENT (Metal)—Electro-Chemical
Bullard Co., The, Bridgeport, Conn.

CLUTCH-BRAKES—Magnetic
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

CLUTCHES
Automatic Safety Clutch Co., Inc., Chicago.
Fairbanks, Morse & Co., Chicago.
Falls Clutch & Mchry. Co., The, Cuyahoga Falls, Ohio.
Medart Co., The, St. Louis, Mo.

CLUTCHES—Magnetic
Cutler-Hammer, Inc., Milwaukee.
Dings Magnetic Separator Co., Milwaukee.
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

CLUTCHES—Safety
Automatic Safety Clutch Co., Inc., Chicago.

COAL
Appalachian Coals, Inc., Cincinnati, Ohio.
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.
Hanna Furnace Corp., The, Detroit, Mich.
Koppers Coal Co., Inc., The, Pittsburgh.

COAL SYSTEMS—Pulverized
Holbeck Engineering Co., Detroit.

COBALT METAL
Central Trading Corp., 511 Fifth Ave., N. Y. C.

COILS—Lead
National Lead Co., 111 Bdway., N. Y. C.

COILS—Pipe
Harrisburg (Pa.) Steel Corp.

COKE—Metallurgical
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., The, Cleveland
Koppers Co., Pittsburgh.

COKE OVENS—By-Products
Koppers Co., Pittsburgh.

COKE OVENS—Cross Regenerators
Koppers Co., Pittsburgh.

COKE OVENS—With Recovery of By-Products
Koppers Co., Pittsburgh.

COLLETS—Drill
Apex Machine & Tool Co., The, Dayton Ohio.

COLUMBIUM
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

COMBUSTION CONTROLS
Leeds & Northrup Co., Philadelphia.
Morgan Construction Co., Worcester, Mass.

COMPOUNDS—Drawing
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Standard Oil Co. (Indiana), Chicago.
Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

COMPRESSED AIR FITTINGS
Schrader's, A., Son, 470 Vanderbilt Ave., Bklyn., N. Y.

COMPRESSORS—Air
Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C.
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Fairbanks, Morse & Co., Chicago.
Ingersoll-Rand Co., 11 Broadway, New York City.
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.
Worthington Pump & Machinery Corp., Harrison, N. J.

COMPRESSORS—Gas
Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C.
Worthington Pump & Machinery Corp., Harrison, N. J.

COMPRESSORS—Rebuilt. (See Clearing House Section)

CONDENSERS—Surface & Jet
Ingersoll-Rand Co., 11 Broadway, N.Y.C.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Harrison, N. J.

CONDUITS—Flexible Metallic
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

CONTRACTORS' SUPPLIES — Second-Hand. (See Clearing House Section)

CONTROL SYSTEMS—Temperature
Leeds & Northrup Co., Philadelphia.

CONTROLLERS—Crane
Clark Controller Co., The, Cleveland.
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., The, Cleveland.

CONTROLLERS—Electric
Clark Controller Co., The, Cleveland.
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., The, Cleveland.
General Electric Co., Schenectady, N. Y.

CONTROLLERS—Valve, Electrically Operated
Cutler-Hammer, Inc., Milwaukee.
Leeds & Northrup Co., Philadelphia.
Vickers, Inc., 1420 Oakman Blvd., Detroit.

CONVEYING AND ELEVATING MACHINERY
Farquhar, A. B., Co., Ltd., York, Pa.
Logan Co., Inc., Louisville, Ky.

CONVEYOR WORMS
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.

CONVEYORS—Gravity
Logan Co., Inc., Louisville, Ky.

CONVEYORS—Monorail
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

CONVEYORS—Portable
Farquhar, A. B., Co., Ltd., York, Pa.

COOLING SYSTEMS—Water
Marley Co., The, Kansas City, Kansas.

COPING MACHINES
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

CORE OIL
Penola, Inc., Pittsburgh.
Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

CORUNDUM WHEELS — See Grinding Wheels

COTTERS AND KEYS—Spring
Hindley Mfg. Co., Valley Falls, R. I.
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.
Lamson & Sessions Co., The, Cleveland.
Western Wire Prods. Co., St. Louis, Mo.

COUNTERBORES
Cleveland (Ohio) Twist Drill Co., The.
Gairing Tool Co., Detroit.
Morse Twist Drill & Mch. Co., New Bedford, Mass.

COUNTERS—Production
Veeder-Root, Inc., Hartford, Ct.

COUNTING MACHINES
Veeder-Root, Inc., Hartford, Conn.

COUPLINGS—Flexible
Diamond Chain & Mfg. Co., Indianapolis, Ind.
Lovejoy Flexible Coupling Co., Chicago.
Poole Foundry & Mch. Co., Baltimore, Md.
Ramsey Chain Co., Inc., Albany, N. Y.

COUPLINGS—Pipe
Harrisburg (Pa.) Steel Corp.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

CRANES—Crawling Tractor
American Hoist & Derrick Co., St. Paul, Minn.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
Ohio Locomotive Crane Co., The, Bucyrus, Ohio.

CRANES — Electric, Industrial, Truck Mounted
Automatic Transportation Co., 75 West 87th St., Chicago, Ill.
Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.

CRANES—Electric Traveling
Armel, James P., Pittsburgh.
Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Conco Engineering Works, Mendota, Ill.
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Euclid Crane & Hoist Co., The, Euclid, O.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.
Maris Brothers, Inc., Philadelphia.
Morgan Engineering Co., The, Alliance, O.
Northern Engineering Works, Detroit, Mich.
Reading (Pa.) Chain & Block Corp.
Robbins & Myers, Inc., Springfield, Ohio.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.
Whiting Corp., Harvey, Ill.

CRANES—Gantry
Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Morgan Engineering Co., The, Alliance, O.
Whiting Corp., Harvey, Ill.

CRANES—Hand Power
Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Conco Engineering Works, Mendota, Ill.
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Euclid Crane & Hoist Co., The, Euclid, O.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
Maris Brothers, Inc., Philadelphia.
Northern Engineering Works, Detroit.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Whiting Corp., Harvey, Ill.

CRANES—Jib
Cleveland Tramrail Div. of the Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Conco Engineering Works, Mendota, Ill.
Euclid Crane & Hoist Co., The, Euclid, O.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

CRANES—Locomotive
American Hoist & Derrick Co., St. Paul, Minn.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
Ohio Locomotive Crane Co., The, Bucyrus, O.

CRANES—Monorail
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Euclid Crane & Hoist Co., The, Euclid, O.
Northern Engineering Works, Detroit.
Reading (Pa.) Chain & Block Corp.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

CRANES—Portable
Canton Fdry. & Mch. Co., Cleveland.

CRANES—Portable Electric
Automatic Transportation Co., 75 West 87th St., Chicago, Ill.
Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.

CRANKSHAFTS
Transue & Williams Steel Forging Corp., Alliance, Ohio.
Union Drawn Steel Co., Massillon, Ohio.

CRANKSHAFTS—Forged
Bay City Forge Co., Erie, Pa.

CRUSHERS—Coal
American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.

CRUSHERS—Steel Turning
American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.

CUTTERS—Die Sinking
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
Tomkins-Johnson Co., The, Jackson, Mich.

CUTTERS—Keyseating
Davis Keyseater Co., 400 Exchange St. Rochester, N. Y.

CUTTERS—Milling
Barber-Colman Co., Rockford, Ill.
Brown & Sharpe Mfg. Co., Providence, R. I.
Cleveland (Ohio) Twist Drill Co., The.
Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
Victor Machinery Exchange, 251 Centre St., N. Y. C.

CUTTING-OFF MACHINES—Abrasives
Tabor Mfg. Co., Phila.

CUTTING-OFF MACHINES—Cold Saw
Espen-Lucas Mch. Wks., Philadelphia.

CUTTING-OFF MACHINES—Pipe or Tubing
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Bardons & Oliver, Cleveland.
Cox & Sons Co., The, Bridgeton, N. J.
Landis Mch. Co., Inc., Waynesboro, Pa.

CUTTING AND WELDING APPARATUS —Oxy-Acetylene—See Welding and Cutting Machines and Equipment—Oxy-Acetylene.

CYLINDERS — Compressed Air & Hydraulic
Hanna Engineering Works, 1761 Elston Ave., Chicago.
Tomkins-Johnson Co., The, Jackson, Mich.

CYLINDERS—Seamless
Harrisburg (Pa.) Steel Corp.
National Tube Co. (U. S. Steel Corp Subsidiary), Pittsburgh.

DEGREASING COMPOUNDS
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

DEOXIDIZERS
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

DIE BLOCKS—Drop Hammer
Heppenstall Co., Pittsburgh.

DIE SINKING MACHINES — Automatic and Hand
Cincinnati (Ohio) Milling Mch. Co., The.
Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.

DIE STOCKS
Ridge Tool Co., Elyria, Ohio.

DIES, JIGS, FIXTURES, etc.
Atlantic Mfg. Co., Philalelphia.
Taft-Peirce Mfg. Co., The, Woonsocket, R. I.

DIES—Alloy Surfaced
Wilcox-Rich Div. of Eaton Mfg. Co., Detroit.

DIES—Cast Tool Steel
Advance Foundry Co., The, Dayton, Ohio.
Forging & Casting Corp., The, Ferndale, Mich.

DIES—Pipe Threading
Landis Mch. Co., Inc., Waynesboro, Pa.
Murchey Machine & Tool Co., Detroit.

DIES—Screw and Thread Cutting
Eastern Mach. Screw Corp., New Haven, Ct.
Geometric Tool Co., The, New Haven, Conn.
Greenfield (Mass.) Tap & Die Corp.
Jones & Lamson Mch. Co., Springfield, Vt.
Landis Mch. Co., Inc., Waynesboro, Pa.
Murchey Machine & Tool Co., Detroit.

DIES—Self-Opening Adjustable
Eastern Mach. Screw Corp., New Haven, Ct.
Geometric Tool Co., The, New Haven, Conn.
Jones & Lamson Mch. Co., Springfield, Vt.
Landis Mch. Co., Inc., Waynesboro, Pa.
Murchey Machine & Tool Co., Detroit.
National Acme Co., The, Cleveland.

DIES—Sheet Metal Working
Ferracute Machine Co., Bridgeton, New Jersey.
Worcester (Mass.), Stamped Metal Co., 6 Hunt St.

DIES—Steel Letters and Stamps
Cunningham, M. E., Co., Pittsburgh.
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

DOORS & SHUTTERS, Fireproof
Kinnear Mfg. Co., Columbus, Ohio.

DOORS & SHUTTERS—Steel or Wood Rolling
Kinnear Mfg. Co., Columbus, Ohio.

DRAWN WORK—Metal—See Stampings or Drawings—Metal

DRILL HEADS—Hydraulic
National Automatic Tool Co., Richmond, Ind.

DRILL HEADS—Multiple
Baker Bros., Inc., Toledo, Ohio.
Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.

DRILLING MACHINES—Bench
Leland-Gifford Co., Worcester, Mass.

DRILLING MACHINES—Heavy Duty
Baker Bros., Inc., Toledo, Ohio.

DRILLING MACHINES—Multiple Spindle
Baker Bros., Inc., Toledo, Ohio.
National Automatic Tool Co., Richmond Ind.

DRILLING MACHINES—Multiple Spindle Adjustable
National Automatic Tool Co., Richmond, Ind.

DRILLING MACHINES—Multiple Spindle Horizontal
Baker Bros., Inc., Toledo, Ohio.
National Automatic Tool Co., Richmond, Ind.

DRILLING MACHINES—Portable Electric
Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C.
Millers Falls Co., Greenfield, Mass.

DRILLING MACHINES—Portable Pneumatic
Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C.
Helwig Mfg. Co., St. Paul, Minn.
Ingersoll-Rand Co., 11 Broadway, New York City.
Warner & Swasey Co., The, Cleveland.

DRILLING MACHINES—Radial
Cincinnati (Ohio) Bickford Tool Co., The.

DRILLING MACHINES—Sensitive
Buffalo (N. Y.) Forge Co., 492 Broadway.
Leland-Gifford Co., Worcester, Mass.

DRILLING MACHINES—Upright
Baker Bros., Inc., Toledo, Ohio.
Buffalo (N. Y.) Forge Co., 492 Broadway.
Cincinnati (Ohio) Bickford Tool Co., The.
Cleereman Machine Tool Co., Green Bay, Wis.

DRILLING MACHINES—Vertical
Baker Bros., Inc., Toledo, Ohio.
Cincinnati (Ohio) Bickford Tool Co., The.
Cleereman Machine Tool Co., Green Bay, Wis.

JUST BETWEEN US TWO

His Melting Point Is Low

THEY still talk about the editor-in-chief of your favorite family journal, in the days when babies were being named Dewey, who used to take off his coat, slip his suspenders off his shoulders and stride around the office with braces flapping like a broken fan belt.

Although the sartorial tone of the Editorial Dept. has risen at least a full octave since then, it will never reach concert pitch, for editors have varying peeling points. Some stick to their coats even when their pants stick to their chairs; others shed at about 90 deg. F., while a few can't write a line unless their shoulders are unfettered. One such is:

Francis J. Juraschek, author of the industrial power transmission series and the material handling series.

A man with such a name should have long, fierce mustaches, and a sinister, forbidding mountain bandit manner. Frank is clean-shaven, poised, quiet-voiced—never hurried nor harried. Having a high power factor, he can get through a prodigious amount of work without the aid of a gawd-but-I'm-busy-don't-disturb manner.

He and Christopher Morley used to sit next to each other as readers in a certain book publishing house; he was half of the advertising agency, Freystadt & Juraschek; he headed the Power Transmission Council. As a connoisseur of foods and wines we'll match him pound for pound against anyone else in the trade paper field.

Vices: He puts an "s" on the first word of *material handling*. That's all, except for a methodicalness which is maddeningly and pathologically perfect.

Aptronym

The Barium Stainless Steel Corporation's metallurgist is Roy F. Lab.

La Même Chose

Seventy-two years ago this week the June 28, 1866, issue of THE IRON AGE said:

> *War has now come. On June 7 nearly the entire Prussian force occupying the Duchy of Schleswig entered Holstein, driving the Austrian brigade of some 5,000 men peaceably before them. . . . The Prussian Governor, Herr von Manteuffel, informs the world that the invasion is of a "purely defensive character."*
>
> *Among the last well-meant efforts to preserve peace those of Frederic of Baden deserve a passing word. This prince and his ministry (are), since 1860, the most enlightened and best beloved of 33, having emancipated the Hebrews, raised the schoolmaster from a man servant of the clergy to a servant of the State, . . . having enabled the poor but industrious to live in wedlock, and permitting thought to be* almost *free. . . .*

Delicate Sledge Hammer Blow

Our money for the year's best headline is on a railroad advertisement headed:

"You take the high road and I'll take the railroad."

Off With Their Heads

> *Editors decapitalize trade names as nonchalantly as you decapitate dandelions while practicing short approaches in your backyard. In a recent issue both the Clark Tructier and Oakite were lower-cased.*
>
> *To have a coined name attain the status of a common noun is flattering, but dangerous. The trade name cellophane, for example, gained such ready acceptance that now du Pont has lost the exclusive use of it. Like aspirin and linoleum, it is now a generic term.*
>
> *Insistence on the capital letter alone won't save a trade name from becoming public property, but it will help.*

He Turned Red

On a recent ferry trip from Jersey City, that hotbed of liberalism, to New York City, our Associate Editor Bill Phair, nose deep in the June 2 IRON AGE, was startled to find himself the object of much muttering and finger pointing.

He hastily checked up on his attire, and found everything in reasonable order, and then glanced at the title of the article he was reading.—"WE THE COMMUNISTS." Men have been jailed for less.

—A.H.D.

PRODUCTS INDEX

DRIVES—Gear
Farrel-Birmingham Co., Inc., Buffalo, N. Y.
Mesta Mch. Co., Pittsburgh.

DRIVES—Single & Multiple V-Belts
Allis Chalmers Mfg. Co., Milwaukee.

DROP FORGINGS—See Forgings—Drop Iron or Steel

DROP HAMMERS—See Hammers—Drop

DUST COLLECTORS
Abrasive Machine Tool Co., East Providence, R. I.
American Foundry Equipment Co., The, 401 Bykrit St., Mishawaka, Ind.
Blaw-Knox Co., Pittsburgh.
Pangborn Corporation, Hagerstown, Md.
Whiting Corp., Harvey, Ill.

ECONOMIZERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

ELECTRIC HEATING ELEMENTS
Globar Div., The Carborundum Co., Niagara Falls, N. Y.

ELECTRIC LIGHTING—Industrial
General Electric Co., Cleveland.
General Electric Vapor Lamp Co., Hoboken, N. J.

ELECTRIC WELDING — See Welding — Electric

ELECTRICAL EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee.
General Electric Co., Schenectady, N. Y

ELECTRICAL MACHINERY — Second Hand. (See Clearing House Section)

ELECTRICAL WIRES
Roebling's, John A., Sons Co., Trenton, N. J.

ELECTRODE HOLDERS—Welding
Lincoln Electric Co., The, Cleveland.

ELECTRODES—Welding, Coated
Electric Arc Cutting & Welding Co., The, Newark, N. J.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Lincoln Electric Co., The, Cleveland.
Maurath, Inc., 7400 Union Ave., Cleveland.

ELECTROPLATING EQUIPMENT & SUPPLIES
Udylite Co., The, Detroit.
United Chromium, Incorporated, 51 East 42nd St., N. Y. C.

ELEVATORS—Steam Hydraulic
Ridgway, Craig, & Son Co., Coatesville, Pa.

EMERY WHEELS—See Grinding Wheels
ENGINEERS—Consulting and Industrial
Hunt, C. H., Pittsburgh, Pa.
Koppers Co., Pittsburgh.

ENGINES—Diesel
Ingersoll-Rand Co., 11 Broadway, N. Y. C.
Worthington Pump & Machinery Corp., Harrison, N. J.

ENGINES—Gas
Fairbanks, Morse & Co., Chicago.
Worthington Pump & Machinery Corp., Harrison, N. J.

ENGINES—Oil
Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C.
Worthington Pump & Machinery Corp., Harrison, N. J.

EYELET MACHINES
Manville, E. J., Mch. Co., Waterbury, Ct.
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

FACERS—Spot
Gairing Tool Co., Detroit.

FACING CLAY
Carborundum Co., The, Perth Amboy, N.J.

FACTORY & PLANT SITES
Zoll, Edward H., Inc., 196 Market St. Newark, N. J.

FANS—Cooling
Perkins, B. F., & Son, Inc., Holyoke, Mass.
South Bend (Ind.) Air Products, Inc.

FANS—Ventilating
Buffalo (N. Y.) Forge Co., 492 Broadway.
South Bend (Ind.) Air Products, Inc.

FEED WATER HEATERS AND PURIFIERS
Harrisburg (Pa.) Steel Corp.

FEEDS—Hydraulic, for Machines
American Engineering Co., Philadelphia.
Oilgear Co., The, 1311 W. Bruce St., Milwaukee.

FELT—Wool Mechanical
American Felt Co.,315 Fourth Ave.,N.Y.C.

FERROALLOYS
Climax Molybdenum Co., 500 Fifth Ave., N. Y. C.
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Pittsburgh Metallurgical Co., Inc., Niagara Falls, N. Y.
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

FERROCHROME
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Pittsburgh Metallurgical Co., Inc., Niagara Falls, N. Y.
Samuel, Frank, & Co., Inc., Philadelphia.
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

FERROMANGANESE
Bethlehem (Pa.) Steel Co.
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Pittsburgh Metallurgical Co., Inc., Niagara Falls, N. Y.
Samuel, Frank & Co., Inc., Philadelphia.

FERROMOLYBDENUM
Climax Molybdenum Co., 500 Fifth Ave., N. Y. C.
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

FERROSILICO MANGANESE
Ohio Ferro-Alloys Corp., Canton, Ohio.
Pittsburgh Metallurgical Co., Inc., Niagara Falls, N. Y.
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

FERROSILICON
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Pittsburgh Metallurgical Co., Inc., Niagara Falls, N. Y.
Samuel, Frank, & Co., Inc., Philadelphia.
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

FERROSILICON ALUMINUM
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

FERROSPIEGELEISEN
New Jersey Zinc Co., The, 160 Front St., N. Y. C.

FERROTITANIUM
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

FERROVANADIUM
Electro Metallurgical Sales Corp., 30 E 42nd St., N. Y. C.
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

FILES & RASPS
Disston, Henry, & Sons, Inc., Philadelphia.
Nicholson File Co., Providence, R. I.

FILING MACHINES
Continental Machine Specialties, Inc., Minneapolis, Minn.

FILTER CLOTH—Asbestos
Johns-Manville Corp., 22 East 40th St., New York City.

FILTER CLOTH—Metallic
Cambridge (Md.) Wire Cloth Co.

FILTERS—Oil
Cuno Engineering Corp., Meriden, Conn.
National Acme Co., The, Cleveland.

FILTERS—Pressure or Gravity
Scaife, Wm. B., & Sons Co., Pittsburgh.

FIRE BRICK—Insulating
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

FIRE CLAY
Carborundum Co., The, Perth Amboy, N. J.
Keagler Brick Co., Steubenville, Ohio.

FITTINGS—Brass, Pipe and Tube
Commonwealth Brass Corp., Detroit.

FIXTURES—For Machine Tools
Knu-Vise Products Co., Detroit, Mich.

FLANGES—Forged Steel
Harrisburg (Pa.) Steel Corp.
Standard Steel Wks. Co., Burnham, Pa.

FLANGES—Welded Steel
King Fifth Wheel Co., 5031 Beaumont Ave., Philadelphia.

FLANGING WORK—Carbon and Alloy
Worth Steel Co., Claymont, Del.

FLEXIBLE SHAFT EQUIPMENT
Lovejoy Flexible Coupling Co., Chicago.

FLOODLIGHTS—Acetylene
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

FLOOR (CONCRETE) REPAIR MATERIALS
Flexrock Co., 892 N. Delaware Ave. Phila., Pa.

FLOOR PLATES—See Plates—Floor or Cellar Door

FLOORING—Acid Proof
Nukem Products Corp., 68 Niagara St. Buffalo, N. Y.

FLOORING—Monolithic
Johns-Manville Corp., 22 East 40th St. New York City.

FLOORING—Open Steel
Blaw-Knox Co., Pittsburgh.
Hendrick Mfg. Co., Carbondale, Pa.

FLUX—Welding
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

FORGING MACHINES—Roll
Ajax Mfg. Co., The, Euclid, Ohio.

FORGING MACHINES—Upset
Ajax Mfg. Co., The, Euclid, Ohio.